CRPL-F 112

FOR OFFICIAL USE

IONOSPHERIC DATA

ISSUED
DECEMBER 1953

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
WASHINGTON, D. C.

CRPL-F 112

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
WASHINGTON, D.C.

Issued
28 Dec. 1953

IONOSPHERIC DATA

CONTENTS

SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1952, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Sixth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Geneva, 1951. Excerpts concerning symbols and terminology from Document No. 626-E of this Meeting are given on pages 2-7 of the report CRPL-F89, "Ionospheric Data," issued January 1952. Reprints of these pages are available upon request.

Beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

The following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given in Document No. 626-E referred to above.

a. For all ionospheric characteristics:

Values missing because of A, C, F, L, M, N, Q, S, or T are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted usually as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count.

Values missing because of D are counted as equal to or greater than the upper limit of the recorder.

Values missing because of G are counted:

1. For foF2, as equal to or less than foF1.
2. For h'F2, as equal to or greater than the median.

The symbol W is included in the median count only when it replaces a height characteristic. This practice represents a change from that listed in issues previous to CRPL-F78.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of E or G (and B when applied to the daytime E region only) are counted as equal to or less than the median foE, or equal to or less than the lower frequency limit of the recorder.

Values of fEs missing for any other reason, and values of h'Es missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If only four values or less are available, the data are considered insufficient and no median value is computed.

2. For the F2 layer, if only five to nine values are available, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as there are at least five values, the median is not considered doubtful.

3. For all layers, if more than half of the values used to compute the median are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

The tables and graphs of ionospheric data are correct for the values reported to the CRPL, but, because of variations in practice in the interpretation of records and scaling and manner of reporting of values, may at times give an erroneous conception of typical ionospheric characteristics at the station. Some of the errors are due to:

a. Differences in scaling records when spread echoes are present.

b. Omission of values when foF2 is less than or equal to foF1, leading to erroneously high values of monthly averages or median values.

c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

These effects were discussed on pages 6 and 7 of the previous F-series report IRPL-F5.

Ordinarily, a blank space in the fEs column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of foE. Blank spaces at the beginning and end of columns of h'F1, foF1, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'F1 and foF1 is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.

b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.

c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.

The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot Number								
	1953	1952	1951	1950	1949	1948	1947	1946	1945
December		33	53	86	108	114	126	85	38
November	16	38	52	87	112	115	124	83	36
October	17	43	52	90	114	116	119	81	23
September	18	46	54	91	115	117	121	79	22
August	18	49	57	96	111	123	122	77	20
July	20	51	60	101	108	125	116	73	
June	21	52	63	103	108	129	112	67	
May	22	52	68	102	108	130	109	67	
April	24	52	74	101	109	133	107	62	
March	27	52	78	103	111	133	105	51	
February	29	51	82	103	113	133	90	46	
January	30	53	85	105	112	130	88	42	

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 48 and figures 1 to 96 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Republica Argentina, Ministerio de Marina:
- Buenos Aires, Argentina
- Decepcion I.

Australian Department of Supply and Shipping, Bureau of Mineral Resources, Geology and Geophysics:
- Watheroo, Western Australia

University of Graz:
- Graz, Austria

c

Meteorological Service of the Belgian Congo and Ruanda-Urundi:
Leopoldville, Belgian Congo

Radio Wave Research Laboratories, National Taiwan University, Taipeh, Formosa, China:
Formosa, China

Danish National Committee of URSI:
Godhavn, Greenland

Institute for Ionospheric Research, Lindau Uber Northeim, Hannover, Germany:
Lindau/Harz, Germany

The Royal Netherlands Meteorological Institute:
De Bilt, Holland

Icelandic Post and Telegraph Administration:
Reykjavik, Iceland

Norwegian Defence Research Establishment, Kjeller per Lillestrom, Norway:
Oslo, Norway
Tromso, Norway

Manila Observatory:
Baguio, P. I.

South African Council for Scientific and Industrial Research:
Capetown, Union of South Africa
Johannesburg, Union of South Africa

Research Laboratory of Electronics, Chalmers University of Technology, Gothenburg, Sweden:
Kiruna, Sweden

Research Institute of National Defence, Stockholm, Sweden:
Upsala, Sweden

Royal Board of Swedish Telegraphs, Radio Department, Stockholm, Sweden:
Lulea, Sweden

Post, Telephone and Telegraph Administration, Berne, Switzerland:
Schwarzenburg, Switzerland

United States Army Signal Corps:
Okinawa I.
White Sands, New Mexico

National Bureau of Standards (Central Radio Propagation Laboratory):

- Anchorage, Alaska
- Fairbanks, Alaska (Geophysical Institute of the University of Alaska)
- Guam I.
- Huancayo, Peru (Instituto Geofisico de Huancayo)
- Maui, Hawaii
- Panama Canal Zone
- Puerto Rico, W. I.
- San Francisco, California (Stanford University)
- Washington, D. C.

HOURLY IONOSPHERIC DATA AT WASHINGTON, D. C.

The data given in tables 49 through 60 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Symbols, Terminology, Conventions." Beginning with September 1949, the data are taken at Ft. Belvoir, Virginia.

IONOSPHERIC STORMINESS AT WASHINGTON, D.C.

Table 61 presents ionosphere character figures for Washington, D. C., during November 1953, as determined by the criteria given in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, geomagnetic K-figures, which are usually covariant with them.

RELATIVE SUNSPOT NUMBERS

Table 62 lists the daily provisional Zürich relative sunspot number, R_Z, as communicated by the Swiss Federal Observatory. Publication of the American relative sunspot numbers, $R_{A'}$, which usually appear monthly in these pages, is temporarily suspended until new arrangements are made for the reduction of the observations made by the Solar Division of the AAVSO.

Tables 63a and 63b give for October 1953 the radio propagation quality figures for the North Atlantic area, CRPL advance and short-term forecasts, a summary geomagnetic activity index and sundry comparisons, specifically as follows:

(a) radio propagation quality figures, separately for each 6-hour interval of the Greenwich day, viz., 00-06, 06-12, 12-18, 18-24 hours UT (Universal Time or GCT).
(b) whole-day radio quality indices (beginning October 1952). Each index is a weighted average of the four quarter-day Q-figures, before rounding off, with half weight given to quality grades 5 and 6. This procedure tends to give whole-day indices suitable for comparison with whole-day advance forecasts which designate whenever possible the days when significant disturbance or unusually quiet conditions will occur.
(c) short-term forecasts, issued by CRPL every six hours (nominally one hour before 00^h, 06^h, 12^h, 18^h UT) and applicable to the period 1 to 13 (especially 1 to 7) hours ahead. Note that new scoring rules have been adopted beginning with October 1952 data.
(d) advance forecasts, issued semiweekly (CRPL-J reports) and applicable 1 to 3 or 4 days ahead, 4 or 5 to 7 days ahead, and 8 to 25 days ahead. These forecasts are scored against the whole-day quality indices.
(e) half-day averages of the geomagnetic K indices measured by the Cheltenham Magnetic Observatory of the U. S. Coast and Geodetic Survey.
(f) illustration of the comparison of short-term forecasts with Q-figures and also with estimates of radio quality based on CRPL observations only.
(g) illustration of the outcome of advance forecasts (1 to 3 or 4 days ahead) and, for comparison, the outcome of a type of "blind" forecast. For the latter the frequency for each quality grade, as determined from the distribution of quality grades in the four most recent months of the current season, is partitioned among the grades observed in the current month in proportion to the frequencies observed in the current month.

The radio propagation quality figures are prepared from radio traffic data reported to CRPL by American Telephone and Telegraph Company, Mackay Radio and Telegraph Company, RCA Communications, Inc., Marconi Company, British Admiralty Signal and Radar Establishment, and the following agencies of the U. S. Government:--Coast Guard, Navy, Army Signal Corps, and State Department. The method of calculation, summarized below, is similar to that described in a 1946 report, IRPL-R31, now out of print. Beginning with recalculated figures for January 1952, only reports of radio transmission on North Atlantic paths closely approximating New York-London are included in the estimation of quality. Observations of selected ionospheric characteristics, even though strongly correlated with radio transmission quality, and traffic reports for paths such as New York-Stockholm or New York-Tangier, previously included in the quality-figure determination with low weight, have been left out of the present calculations inasmuch as a sufficient number of homogeneous reports are now available.

The original reports are submitted on various scales and for various time intervals. The observations for each 6-hour interval are averaged on the quality scale of the original reports. These 6-hour indices are then adjusted to the 1 to 9 quality-figure scale by a conversion table prepared by comparing the distribution of these indices for at least four months, usually a year,

with a master distribution determined from analysis of the reports originally made on the 1 to 9 quality-figure scale. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. The 6-hourly quality figures are (subjectively) weighted means of the reports received for that period. These 6-hourly quality figures replace, beginning January 1953, the half-daily quality figures which formerly appeared in this table.

These quality figures are, in effect, a consensus of reported radio propagation conditions in the North Atlantic area. The reasons for low quality are not necessarily known and may not be limited to ionospheric storminess. For instance, low quality may result from improper frequency usage for the path and time of day. Although, wherever it is reported, frequency usage is included in the rating of reports, it must often be an assumption that the reports refer to optimum working frequencies. It is more difficult to eliminate from the indices conditions of low quality because of multipath, interference, etc. These considerations should be taken into account in interpreting research correlations between the Q-figures and solar, auroral, geomagnetic or similar indices.

Note. The North Pacific quality figures, which were published through October 1951, have been temporarily discontinued. Since the establishment of the North Pacific Radio Warning Service at Anchorage, Alaska, a larger number of reports are being received than were previously available in Washington. The preparation of the quality figures will be resumed when sufficient data have been accumulated for determination of conversion tables for these new reports.

OBSERVATIONS OF THE SOLAR CORONA

Tables 64 through 66 give the observations of the solar corona during November 1953, obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 67 through 69 list the coronal observations obtained at Sacramento Peak, New Mexico, during November 1953, derived by Harvard College Observatory as a part of its performance of a research contract with the Upper Air Research Observatory, Geophysical Research Directorate, Air Force Cambridge Research Center. The data are listed separately for east and west limbs at 5-degree intervals of position angle north and south of the Solar Equator at the limb. The time of observation is given to the nearest tenth of a day, GCT.

Table 64 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 65 gives similarly the intensities of the first red (6374A) coronal line; and table 66, the intensities of the second red (6702A) coronal line; all observed at Climax in November 1953.

Table 67 gives the intensities of the green (5303A) coronal line; table 68, the intensities of the first red (6374A) coronal line; and table 69, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in November 1953.

The following symbols are used in tables 64 through 69: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

SUDDEN IONOSPHERE DISTURBANCES

Table 70a lists the sudden ionosphere disturbances observed at Ft. Belvoir, Virginia, for October 1953. Table 70b shows that no sudden ionosphere disturbances were observed at Ft. Belvoir during the month of November 1953.

OBSERVATIONS OF SOLAR FLARES

Table 71 gives the preliminary record of solar flares reported to the CRPL. These reports are communicated on a rapid schedule at the sacrifice of detailed accuracy. Definitive and complete records are published later in the Quarterly Bulletin of Solar Activity, I.A.U., in various observatory publications, and elsewhere. The present listing serves to identify and roughly describe the phenomena observed. Details should be sought from the reporting observatory.

Reporting directly to the CRPL are the following observatories: Mt. Wilson, McMath-Hulbert, U. S. Naval, Wendelstein, Kanzel and High Altitude at Sacramento Peak, New Mexico. The remainder report to Meudon (Paris) and the data are taken from the Paris-URSIgram broadcast, monitored fairly regularly by the CRPL. The data on solar flares reported from Sacramento Peak, New Mexico, communicated by the High Altitude Observatory at Boulder, Colorado, are provided by Harvard University as the result of work undertaken on an Air Materiel Command Research and Development Contract administered by the Air Force Cambridge Research Laboratories.

The table lists for each flare the reporting observatory, date, times of beginning and ending of observation, duration (when known), total area (corrected for foreshortening), and heliographic coordinates. For the maximum phase of the flare is given the time, intensity, area relative to the total area, and the importance. The column "SID observed" is to indicate when a sudden ionosphere disturbance, noted elsewhere in these reports, occurred at the time of a flare. Times are in Universal Time (GCT).

INDICES OF GEOMAGNETIC ACTIVITY

Table 72 lists various indices of geomagnetic activity based on data from magnetic observatories widely distributed throughout the world. The indices are: (1) preliminary international character-figures, C; (2) geomagnetic planetary three-hour-range indices, Kp; (3) magnetically selected quiet and disturbed days.

The C-figure is the arithmetic mean of the subjective classification by all observatories of each day's magnetic activity on a scale of 0 (quiet) to 2 (storm). The magnetically quiet and disturbed days are selected by the international scheme outlined on pages 219-227 in the December 1943 issue of Terrestrial Magnetism and Atmospheric Electricity. The details of the currently used method follow. For each day of a month, its geomagnetic activity is assigned by weighting equally the following three criteria: (1) the sum of the eight Kp's; (2) the greatest Kp; and (3) the sum of the squares of the eight Kp's.

Kp is the mean standardized K-index from 11 observatories between geomagnetic latitudes 47 and 63 degrees. The scale is 0 (very quiet) to 9 (extremely disturbed), expressed in thirds of a unit, e.g., 5- is 4 2/3, 5o is 5 0/3, and 5+ is 5 1/3. This planetary index is designed to measure solar particle-radiation by its magnetic effects, specifically to meet the needs of research workers in the ionospheric field. A complete description of Kp has appeared in Bulletin 12b, "Geomagnetic Indices C and K, 1948," published in Washington, D. C., 1949, by the Association of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics. Kp is available from 1937 to date as noted in F108.

The Committee on Characterization of Magnetic Disturbance, ATME, IUGG, has kindly supplied this table. The Meteorological Office, De Bilt, Holland, collects the data and compiles C and selected days. The Chairman of the Committee computes the planetary index. Current tables are also published quarterly in the Journal of Geophysical Research along with data on sudden commencements (sc) and solar flare effects (sfe).

INDEX OF IONOSPHERIC DATA PUBLISHED IN 1953 (CRPL-F 101 THROUGH F 112)

The following index of tables and graphs of ionospheric data published in the CRPL-F series in 1953 is divided into two parts. Part I is an index of data observed in 1952 and 1953. Part II is an index of data observed prior to 1952.

In general, both table and graphs for a given station for a given month appear in the same issue.

Indexes of ionospheric data published prior to 1953 are in IRPL-F17, CRPL-F28, -F40, -F52, -F64, -F76, -F88, and F100.

PART I

Index of Tables and Graphs of Ionospheric Data Observed in 1952 and 1953 and Published in 1953 (CRPL-F101 through F112)

Station	1952												1953										
	J	F	M	A	M	J	Jy	A	S	O	N	D	J	F	M	A	M	J	Jy	A	S	O	N
Adak, Alaska											101	102	103	104	105	106	107	108	109	110			
Akita, Japan									101	102	102	105	106	107	108	108	110	111					
Anchorage, Alaska										102/	103	103	103	105	105	106	107	108	109	110#	111	112	
Baguio, P.I.					103	103	103	103	103	103	103	104	105	106	107	107	108	109	111	112			
Baker Lake, Canada									102	102	104	104	105	106	107	108	109	110	111	111			
Baton Rouge, Louisiana										101	101	102	104	104	105	107	108	108	110	111			
Bombay, India					101	101	101	101	102	104	105	106	109	109									
Brisbane, Australia							101	101	102	103	104	106	107	109	110								
Buenos Aires, Argentina										105	105	105	108	108	110	110	110	110	110	111	112		
Calcutta, India			102	102	102	102	103	103	103	106	106	106	110	110	110	110	110	111	111				
Canberra, Australia							101	101	102	103	104	106	107	109	110								
Capetown, Union of S.Africa									102	102	103	104	105	106	107	107		109	112	112			
Casablanca, Morocco	103	103	103	105	106	106	106																
Christchurch, New Zealand					101		104	104	105	105	105	105	108	108	109	109	111	111					
Churchill, Canada									101	102	102	104	105	105	107	107		110		111			
Dakar, French West Africa	107	102	105	105	109	109	110	110	110														
De Bilt, Holland										101	102	103	104	105	107	107	108	109	110	111	112		
Decepcion I.										105	105	105	108	108	110	110	110	110	110	111	112		
Delhi, India					101	101	101	101	102	104	105	106	109	109									
Djibouti, French Somaliland		103	102	107	107	110																	
Domont, France	103	103	103																				
Fairbanks, Alaska											101	102	104	104	105	106	107	108	109	110	111	112	
Falkland Is.						102	104	106	106	107	107	108	109	110									
Formosa, China								101	101	102	102	103	104	105	106	107	108	109	110	112	112		
Fort Chimo, Canada									101	102	104	104	105	106	107	108	109	110	111	111			
Fribourg, Germany		103	103	105	105	110	110	110															
Godhavn, Greenland	104			105	105	106	112		103	106	112	112	112	112	112	112	112	112	112				
Graz, Austria											101	102	103	104	105	106	107	108	112	112	112	112	
Guam I.		103			103			103			101	102	103	104	105	106	107	108	109	110	111	112	
Hobart, Tasmania							101	101	102	103	104	106	107	109	110								
Huancayo, Peru											101	103	103	105	106	107	108	109	110	110	112	112	
Ibadan, Nigeria						102	106	108	108	109	108	110											
Inverness, Scotland							102	104	106	106	107	107	108	109	110								
Johannesburg, Union of S.Africa									102	102	103	104	105	106	107	107		109	112	112			
Khartoum, Sudan						104	104		106	106	107	107	108	110									
Kiruna, Sweden										101	102	103	103	104	106	107	108	109	110	112	112		
Leopoldville, Belgian, Congo														105	106	107	108	109	110	111	112		
Lindau/Harz, Germany										102	102	103	105	106	107	108	109	109		112			
Lulea, Sweden							109	108	108											112	112		
Macquarie I.	104	104	104																				
Madras, India					101	101	101	101	102	104	105	106	109	109									
Maui, Hawaii											101	102	103	104	105	106	107	108	109	110	111	112	
Nairobi, Kenya				101	107																		
Narsarssuak, Greenland										101*	101*	102	103	104	105	107	107	108	109	110	111		
Okinawa I.										101	101	102	103	104	105	106	107	108	109	110	111	112	
Oslo, Norway											101	102	103	104	105	106	107	108	109	110	111	112	
Ottawa, Canada									101	102	102	104	105	105	106	107	109	110	111	111			
Panama Canal Zone										101	101	102	103	104	105	107	107	108	109	110	111	112	
Point Barrow, Alaska									101	101	101	102	103	106	109	109	109	111					
Poitiers, France	103	103	103	105	106	106	106	107	107														
Port Lockroy						102	104	106	106	107	107	108	109	110									
Prince Rupert, Canada									101	102	102	104	105	105	107	107	109	110	111	111			
Puerto Rico, W.I.											101	102	103	104	105	106	107	108	109	110	111	112	
Rarotonga I.					101	101	104	104	105	105	105	105	108	108	109	109	111	111					
Resolute Bay, Canada									101	102	104	105	105	106	106	108	109	110	111	111			

PART I (CONTINUED)

Station	1952 J	F	M	A	M	J	Jy	A	S	O	N	D	1953 J	F	M	A	M	J	Jy	A	S	O	N
Reykjavik, Iceland									101	102	103	104	104	106	107	107	112						
St.John's, Newfoundland									101	102	102	104	105	105	106	108	109	110	111	111			
San Francisco, California											101	102	103	104	105	106	107	108	109	110	111	112	
Schwarzenburg, Switzerland										101	102	103	104	105	107	107	108	109	110	111	112		
Singapore, British Malaya							102	104	106	106	107	107	108	109	110								
Slough, England							102	104	106	106	107	107	108	109	110								
Tananarive, Madagascar				102	102	106	106	106	107	108	109	110											
Tiruchy, India					101	101	101	101	102	104	105	106	109	109									
Tokyo, Japan									101	102	103	105	106	107	108	108	110	111					
Townsville, Australia							101	101	102	103	104	106	107	109	110								
Tromso, Norway											101	102	103	104	105	106	107	103	109	110	111	112	
Upsala, Sweden											101	102	103	104	105	106	107	108	109	110"	111	112	
Wakkanai, Japan									101	102	102	105	106	107	108	108	110	111					
Washington, D.C.												101	102	103	104	105	106	107	108	109	110	111	112
Watheroo, Western Australia									101	101	103	104	105	106	106	108	108	109	111	112			
White Sands, New Mexico											101	102	103	104	105	106	107	108	109	110	111	112	
Winnipeg, Canada									101	102	102	104	105	105	106	107	109	110	111	111			
Yamagawa, Japan									101	102	103	105	106	107	108	108	110	111					

† (M3000)F2 column only. See table 33, p. 18, F102.
# See erratum 1 in F111, p.11.
* See erratum in F101, p.12.
" See erratum 2 in F111, p.11.

PART II

Index of Tables and Graphs of Ionospheric Data Observed Prior to 1952 and Published in 1953 (CRPL-F101 through F112)

Station	1951 J	F	M	A	M	J	Jy	A	S	O	N	D
Godhavn, Greenland											104	
Macquarie I.						104	104	104	104	104	104	104
Terre Adelie										101		

Table 1

Washington, D. C. (38.7°N, 77.1°W) November 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(280)	2.4					2.4	3.0
01	(270)	2.6						(3.1)
02	260	(2.8)						3.2
03	250	3.0						3.2
04	250	2.8						3.3
05	240	2.7					2.4	3.3
06	240	2.4						3.3
07	230	3.6						3.4
08	230	5.2	210	—	120	2.0	2.2	3.6
09	240	5.7	210	—	110	2.4	2.7	3.5
10	250	5.8	200	3.7	110	2.6	3.0	3.5
11	250	6.0	200	3.8	100	2.7	2.7	3.4
12	260	6.4	210	3.9	100	2.8	2.7	3.4
13	250	6.7	210	3.9	100	2.8	3.0	3.5
14	250	6.4	220	3.7	100	2.6		3.5
15	240	6.2	220	3.0	110	2.4	2.4	3.5
16	230	6.0	220	—	120	1.9	2.1	3.5
17	210	5.2					2.2	3.5
18	220	4.0					2.2	3.3
19	240	3.2					2.2	3.3
20	(250)	2.7						3.2
21	(270)	2.3						3.2
22	(280)	2.3					2.1	3.0
23	(280)	2.3					1.3	3.0

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 2

Tromso, Norway (69.7°N, 19.0°E) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	—	—					4.4	—
01	—	—					4.0	—
02	(340)	(2.1)					4.0	(3.0)
03	320	2.1					3.1	3.0
04	295	2.0					2.8	3.0
05	290	2.0			—	—	2.8	3.0
06	255	2.5			—	1.2	2.4	3.1
07	245	3.4	240	—	110	1.4	2.7	3.3
08	245	4.0	235	—	130	1.7	2.7	3.4
09	245	4.2	230	—	120	1.9	1.8	3.4
10	245	4.5	230	—	120	2.0	2.1	3.4
11	245	4.8	235	—	120	2.1	2.2	3.4
12	245	4.5	220	—	115	2.1	2.8	3.4
13	240	4.6	220	—	110	2.0	2.5	3.4
14	240	4.5	230	—	120	1.9	2.5	3.4
15	240	4.2	235	—	120	1.7	2.7	3.4
16	240	4.2	—	—	125	1.4	2.7	3.4
17	240	3.6			—	—	3.0	3.2
18	246	3.4					3.5	3.2
19	(260)	2.8					3.3	3.2
20	—	—					3.8	—
21	—	—					4.2	—
22	—	—					3.9	—
23	—	—					4.0	—

Time: 15.0°E.
Sweep: 0.5 Mc to 25.0 Mc in 6 minutes, automatic operation.

Table 3

Fairbanks, Alaska (64.9°N, 147.8°W) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(290)	(2.0)					5.2	(2.5)
01	(330)	(2.8)					5.4	—
02	(380)	(2.5)					5.2	(2.8)
03	(380)	(2.3)					4.6	(2.7)
04	(350)	(2.2)					5.5	(2.8)
05	350	2.2					6.0	2.9
06	320	2.6			130	1.8	3.7	2.9
07	260	3.2	—	—	130	1.9	3.6	3.1
08	250	3.6	220	—	130	1.9	2.0	3.2
09	280	4.2	220	(3.4)	120	2.1	2.2	3.2
10	280	4.4	220	(3.6)	120	2.2	2.3	3.1
11	280	4.6	220	(3.5)	120	2.2	2.5	3.2
12	280	4.5	220	(3.6)	120	2.3	2.0	3.2
13	260	4.8	220	—	120	2.3	2.1	3.2
14	250	4.7	220	—	130	2.1	1.8	3.3
15	240	4.5	220	—	140	2.0		3.3
16	230	4.4	—	—	140	1.8		3.3
17	240	3.9						3.3
18	240	3.0					4.4	3.2
19	260	2.3					3.4	3.1
20	300	2.2					5.0	3.0
21	290	2.4					5.0	3.0
22	290	2.0					5.5	3.0
23	(320)	(2.0)					6.6	(2.8)

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 4

Anchorage, Alaska (61.2°N, 149.9°W) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	2.0					2.8	3.0
01	350	2.4					2.2	2.8
02	380	(2.3)					2.7	(2.8)
03	340	(2.8)					2.8	(2.7)
04	(340)	2.9					3.6	(2.8)
05	(320)	2.3					2.7	2.8
06	270	2.4					2.6	3.1
07	240	3.3	220	—	115	1.7	1.5	3.3
08	250	3.9	215	3.2	110	2.0		3.3
09	280	4.4	210	3.4	110	2.3		3.3
10	280	4.7	200	3.5	100	2.4		3.3
11	280	5.0	210	3.6	100	2.5		3.3
12	280	5.2	200	3.5	100	2.5		3.3
13	250	5.0	215	3.5	100	2.5		3.4
14	250	4.8	220	3.5	100	2.4		3.4
15	240	4.9	220	—	110	2.2		3.4
16	230	4.5	230	—	110	1.9		3.4
17	220	4.2			—	—		3.4
18	220	3.5						3.3
19	235	2.8					1.8	3.2
20	275	2.2					1.5	3.1
21	280	2.1					2.1	3.1
22	280	2.0					2.8	3.1
23	310	2.2					3.2	3.0

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 5

Oslo, Norway (60.0°N, 11.1°E) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(280)	2.0						2.9
01	300	1.8					1.9	2.8
02	285	1.8					2.1	2.8
03	280	1.7					2.4	2.9
04	290	1.7					2.4	2.9
05	270	1.6					1.4	2.9
06	270	2.1					2.8	3.1
07	345	3.2	—	—	—	1.4		3.2
08	240	>4.0	230	—	115	1.8	1.8	3.4
09	230	4.4	325	—	105	2.1	3.2	3.5
10	210	5.0	215	3.6	105	2.2	3.1	3.4
11	250	5.1	210	3.5	105	2.3	3.2	3.4
12	250	5.4	210	3.7	105	2.3	3.1	3.5
13	245	5.6	215	3.5	105	2.3	3.0	3.4
14	245	5.5	220	3.4	100	2.4	2.9	3.4
15	235	5.3	225	—	105	2.2	2.9	3.4
16	230	5.0	230	—	110	2.0	3.0	3.4
17	230	4.9	—	—	110	1.5	1.5	3.3
18	230	4.6						3.2
19	240	4.4						3.3
20	245	3.7						3.2
21	250	3.0						3.1
22	(250)	2.4						3.0
23	---	2.1						3.0

Time: 15.0°E.
Sweep: 0.8 Mc to 14.0 Mc in 8 minutes, automatic operation.

Table 6

Upsala, Sweden (59.8°N, 17.6°E) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(300)	2.0					2.3	2.7
01	315	(2.0)					2.3	2.7
02	310	2.0					2.7	2.7
03	290	1.9					3.1	(2.8)
04	290	1.8					2.6	2.8
05	300	(1.7)					2.9	2.8
06	260	2.3			—	E	2.5	3.0
07	235	3.5	220	—	—	1.5	2.4	3.3
08	245	4.3	230	(3.1)	120	2.0	2.4	3.4
09	245	4.6	225	3.3	115	2.2	2.8	3.4
10	255	5.1	220	3.5	115	2.3	3.3	3.3
11	255	5.3	220	3.5	110	2.4	2.5	3.3
12	245	5.3	220	3.5	110	2.4	3.1	3.3
13	240	5.7	220	3.5	115	2.2	2.5	3.3
14	240	5.5	225	3.3	115	2.2	2.3	3.3
15	230	5.2	230	(3.2)	115	2.0	2.3	3.4
16	230	4.8	235	(2.5)	—	E	2.3	3.3
17	230	4.5			—	E	2.4	3.2
18	235	4.2					2.9	3.1
19	235	3.6					2.3	3.1
20	235	2.7					2.3	3.0
21	250	2.5					2.9	3.0
22	270	2.2					2.3	2.9
23	280	2.1					2.3	2.8

Time: 15.0°E.
Sweep: 1.4 Mc to 17.0 Mc in 8 minutes, automatic operation.

Table 7

Graz, Austria (47.1°N, 15.5°E) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	295	3.4						
01	300	3.3						
02	290	3.3						
03	270	3.3						
04	270	3.1						
05	230	2.9						
06	240	3.0						
07	200	4.4						
08	210	5.0	200	3.5				
09	210	5.9	200	3.8				
10	230	6.0	200	4.0			3.6	
11	240	6.8	200	4.0			3.6	
12	240	6.3	200	4.0			3.7	
13	230	6.2	200	3.9			3.6	
14	230	6.0	200	3.9				
15	220	6.2	215	3.5				
16	210	6.2						
17	200	5.5						
18	220	5.0						
19	230	4.5						
20	220	3.8						
21	250	3.3						
22	280	3.3						
23	280	3.2						

Time: 15.0°E.
Sweep: 2.5 Mc to 12.0 Mc in 2 minutes.

Table 8

San Francisco, California (37.4°N, 122.2°W) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(250)	(3.1)						(3.1)
01	(260)	(3.2)						(3.1)
02	(260)	(3.1)						(3.1)
03	(260)	(3.2)						(3.1)
04	(260)	(3.3)						(3.1)
05	(250)	(3.3)					2.6	(3.2)
06	250	(3.6)					3.4	(3.2)
07	240	(5.2)	230	---	(120)	(1.9)	3.8	(3.5)
08	240	5.7	210	(3.6)	110	(2.4)	3.8	3.5
09	250	6.0	210	(4.0)	100	(2.6)	4.2	3.4
10	280	6.1	200	(4.1)	110	(2.8)	4.0	3.3
11	280	6.3	190	(4.1)	100	(3.0)	5.0	3.3
12	290	6.4	200	(4.2)	100	(3.1)	4.0	3.2
13	280	6.4	210	(4.1)	100	(3.1)	4.0	3.3
14	280	6.2	220	(4.1)	100	(3.0)	3.7	3.3
15	270	6.0	230	---	110	2.7	3.4	3.5
16	240	5.8	230	---	110	(2.2)	2.8	3.5
17	230	5.6	---	---	---	---	3.1	3.6
18	220	4.4					2.9	3.5
19	(220)	3.4					2.5	3.4
20	(240)	2.9					2.4	3.3
21	(250)	(2.8)					2.6	(3.1)
22	(260)	(3.0)					2.2	3.2
23	(250)	(3.2)					2.4	3.1

Time: 120.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 9

White Sands, New Mexico (32.3°N, 106.5°W) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.4						3.1
01	280	3.4						3.1
02	270	3.5						3.1
03	260	3.5						3.1
04	260	3.4						3.0
05	270	3.4						3.0
06	250	3.7						3.2
07	240	5.2	230	---	120	1.9		3.5
08	250	5.8	220	3.8	110	2.4	3.0	3.4
09	260	6.0	210	4.1	110	2.6	2.9	3.4
10	280	6.0	200	4.3	110	2.8	2.9	3.3
11	280	6.2	210	4.2	110	3.0	2.8	3.2
12	290	6.8	210	4.3	110	3.1	3.0	3.3
13	280	6.7	220	4.2	110	3.1	3.2	3.2
14	290	6.7	220	4.2	110	3.0		3.2
15	270	5.6	230	4.0	110	2.8	2.3	3.3
16	250	6.4	230	---	110	2.4	2.5	3.4
17	230	6.3	---	---	---	---	2.4	3.5
18	220	5.4						3.5
19	230	3.8						3.4
20	260	3.0						3.2
21	280	3.1						3.1
22	300	3.3						3.0
23	280	3.3						3.0

Time: 105.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 10

Okinawa I. (26.3°N, 127.8°E) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.5						3.0
01	270	3.6						3.2
02	250	3.5						3.2
03	240	3.4						3.5
04	240	3.2						3.4
05	240	3.0						(3.4)
06	230	3.9			---	(2.0)		3.5
07	230	6.1	---	---	120	(2.0)	3.1	3.6
08	240	6.8	220	---	110	2.7	4.2	3.6
09	260	7.5	220	4.3	110	2.9	4.8	3.3
10	260	8.8	210	4.4	110	3.1	4.7	3.4
11	270	8.8	200	4.4	110	3.2	4.6	3.3
12	280	9.9	200	4.5	110	(3.2)	4.4	3.2
13	280	10.8	200	4.5	110	3.1	4.4	3.3
14	260	11.3	220	4.4	110	3.0	4.7	3.2
15	240	11.0	230	4.2	110	2.9	4.0	3.5
16	240	8.9	230	---	110	2.4	4.0	3.5
17	230	8.1			110	(1.9)	4.0	3.6
18	210	6.6					3.8	3.6
19	220	5.2					3.2	3.4
20	240	4.2					2.7	3.2
21	260	3.8					3.0	(3.2)
22	270	3.6					1.9	3.0
23	300	3.3						3.0

Time: 127.5°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 11

Maui, Hawaii (20.8°N, 156.5°W) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	3.5					2.3	3.2
01	240	3.4					2.2	3.5
02	240	3.0					2.2	3.3
03	230	2.4					1.8	3.4
04	260	2.2					1.9	3.2
05	300	2.0					1.5	3.0
06	290	2.4					1.7	2.9
07	250	5.4	240	---	130	1.9	2.8	3.4
08	270	6.9	230	---	120	2.5	4.8	3.3
09	290	7.4	220	(4.3)	120	2.8	4.8	3.1
10	310	8.5	210	4.5	120	3.1	5.3	3.0
11	300	9.6	210	4.6	120	3.2	5.2	3.0
12	300	9.9	210	4.6	110	3.3	4.9	3.0
13	300	11.1	210	4.5	110	3.3	5.6	3.0
14	290	11.4	220	4.4	110	3.1	5.3	3.1
15	270	11.6	230	4.3	110	3.0	5.7	3.3
16	250	9.9	240	4.1	120	2.6	4.0	3.4
17	230	8.1	240	---	(120)	2.1	4.0	3.5
18	220	6.2			---	---	4.0	3.5
19	230	4.5					4.0	3.4
20	250	3.6					3.2	3.2
21	290	3.3					3.3	2.9
22	300	3.3					2.8	2.9
23	280	3.3					2.4	3.1

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 12

Puerto Rico, W.I. (18.5°N, 67.2°W) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.5						2.9
01	260	3.7						3.1
02	240	3.8						3.3
03	220	3.8						3.5
04	230	3.1						3.3
05	250	2.8						3.1
06	250	2.8						3.1
07	220	5.0	---	---	120	1.9		3.6
08	240	5.8	230	---	110	2.5		3.5
09	270	6.3	210	4.3	110	2.8		3.4
10	280	7.1	210	4.4	110	3.1		3.3
11	280	7.8	220	4.4	110	3.2		3.3
12	280	7.9	220	4.5	110	3.3		3.3
13	280	8.4	220	4.4	110	3.2		3.3
14	260	8.8	220	4.3	110	3.1		3.3
15	250	8.6	220	4.2	110	3.0	4.5	3.4
16	240	7.8	220	---	110	2.7	4.3	3.5
17	230	7.0	220	---	110	2.1	4.0	3.5
18	220	6.0					3.3	3.5
19	220	4.5					3.1	3.3
20	240	3.9					2.4	3.2
21	260	3.4					2.8	3.0
22	280	3.5					2.3	3.0
23	270	3.6						3.0

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 13

Guam I. (13.5°N, 144.9°E) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	6.0						3.2
01	260	5.8						3.3
02	240	5.8						3.4
03	230	5.0						3.5
04	240	3.5						3.5
05	260	3.1						3.4
06	260	3.0						3.3
07	240	5.2	230	---	---	---		3.6
08	(250)	7.4	220	---	110	2.6	3.4	3.3
09	290	8.7	210	---	110	2.9	4.0	3.0
10	310	9.1	210	4.4	110	3.1	4.1	2.6
11	320	8.8	200	---	110	(3.2)	3.8	2.5
12	330	8.4	200	4.5	110	3.3	4.0	2.5
13	320	8.5	200	4.4	(110)	(3.2)	4.4	2.6
14	300	9.3	220	4.4	110	3.2	4.2	2.8
15	290	10.2	220	---	110	3.0	4.9	3.0
16	270	10.8	220	---	110	2.7	4.0	3.2
17	250	10.6	230	---	---	---	3.9	3.3
18	240	10.6	---	---			3.5	3.3
19	240	9.9					3.2	3.3
20	230	9.0						3.3
21	220	7.6						3.3
22	250	6.6						3.2
23	260	5.0						3.2

Time: 150.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 14

Panama Canal Zone (9.4°N, 79.9°W) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	3.4						3.4
01	240	3.4						3.4
02	220	2.9						3.5
03	220	2.4					2.2	3.3
04	250	2.2					1.8	3.2
05	270	2.3					3.8	3.0
06	260	3.0					3.6	3.1
07	240	5.4	---	---	120	(2.1)	4.2	3.4
08	280	5.6	230	(4.2)	110	2.7	4.0	3.3
09	300	7.8	220	4.4	110	3.0	4.3	3.1
10	300	8.9	220	4.5	110	3.2	4.2	3.1
11	300	9.8	220	4.5	110	3.3	4.8	3.1
12	300	10.4	220	4.5	110	3.4	4.5	3.1
13	280	10.5	220	4.5	110	3.4	4.8	3.2
14	280	10.8	220	4.4	110	3.3	4.7	3.2
15	270	10.4	220	4.3	110	3.0	5.2	3.2
16	260	9.8	220	(4.1)	110	2.7	4.6	3.3
17	240	9.2	230	---	110	2.1	4.6	3.4
18	220	7.2					4.3	3.4
19	230	5.3					4.0	3.3
20	220	4.4					2.5	3.4
21	240	3.5					2.2	3.3
22	270	3.1					2.0	3.0
23	300	3.1						2.9

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 15

Huancayo, Peru (12.0°S, 75.3°W) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	6.7						3.0
01	260	6.2						3.2
02	250	4.8						3.3
03	250	4.0						3.4
04	250	3.0						3.4
05	340	2.4						3.4
06	240	5.1			130	1.6	3.6	3.4
07	(270)	7.2	220	---	110	2.4	5.8	3.3
08	290	8.2	210	4.2	110	2.9	10.4	3.0
09	320	8.7	200	4.3	110	---	11.9	2.6
10	350	7.9	200	4.5	110	---	11.9	2.6
11	350	7.6	200	4.6	110	---	12.8	2.6
12	350	7.8	200	4.5	110	---	12.2	2.6
13	340	8.0	190	4.4	110	---	12.0	2.6
14	330	8.2	200	4.4	110	---	11.3	2.7
15	300	8.6	190	4.2	110	---	10.2	2.6
16	280	9.0	200	---	110	---	9.1	2.7
17	250	9.0	240	---	110	3.2	5.8	2.8
18	260	9.2			---	---		2.9
19	270	8.8						2.9
20	260	8.4						3.0
21	250	8.2						3.0
22	240	8.1						3.0
23	270	7.4						3.0

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 16

Kiruna, Sweden (67.8°N, 20.5°E) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	370	(2.5)					4.0	(2.8)
01	340	(2.7)					4.0	(3.0)
02	345	(2.7)					3.1	(3.0)
03	320	(2.2)					3.2	(3.2)
04	275	(2.5)					2.1	(3.2)
05	280	3.0						3.1
06	255	3.6	---	---	---	---		3.1
07	290	4.0	---	3.3	130	2.1		3.2
08	310	4.2	245	3.7	120	2.3		3.2
09	330	4.3	230	3.8	115	2.6		3.2
10	340	4.7	210	3.8	110	2.8		3.1
11	310	5.0	230	3.9	110	2.9		3.2
12	310	4.7	230	3.8	110	2.9		3.2
13	300	4.8	220	3.8	110	2.8		3.2
14	305	4.7	230	3.7	115	2.7		3.2
15	280	4.3	230	3.6	120	2.4		3.2
16	270	4.1	240	3.2	130	2.2		3.2
17	255	4.0	---	---	---	2.0		3.2
18	255	3.9	---	---	---	---	2.1	3.1
19	270	3.9					2.6	3.1
20	280	3.8					3.8	3.0
21	300	3.3					4.0	3.1
22	300	3.4					3.9	2.9
23	340	2.9					4.1	3.0

Time: 15.0°E.
Sweep: 0.8 Mc to 15.0 Mc in 30 seconds.

Table 17

Lulea, Sweden (65.6°N, 22.1°E) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(340)	2.0					2.8	
01								
02	(340)	(2.0)					2.4	
03								
04	(310)	(2.1)						
05								
06	250	3.5	240	2.6	120	1.8	2.0	
07								
08	290	4.2	225	3.5	115	2.4	2.4	
09								
10	320	4.6	210	3.9	110	2.5	2.7	
11								
12	310	4.8	210	3.9	110	2.7		
13								
14	300	4.7	220	3.7	110	2.6		
15								
16	250	4.3	230	3.3	125	2.2		
17								
18	250	3.8	---	---	---	---	1.9	
19								
20	270	3.0						
21								
22	305	2.2					2.7	
23								

Time: 15.0°E.
Sweep: 1.5 Mc to 10.0 Mc in 6 minutes, automatic operation.

Table 18

DeBilt, Holland (52.1°N, 5.2°E) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	3.0					2.0	3.1
01	<280	2.7					2.0	3.1
02	275	2.4						3.1
03	<280	2.2						3.1
04	<280	2.1					3.0	3.1
05	260	2.4	---	---	---	E	2.1	3.3
06	230	3.5	210	2.9	110	1.9		3.5
07	290	4.1	210	3.4	105	2.2	2.3	3.4
08	280	4.6	200	3.7	100	2.5		3.4
09	300	4.8	200	3.9	100	2.7		3.4
10	300	5.1	200	4.0	100	2.9	3.0	3.4
11	300	5.2	200	4.1	100	3.0		3.5
12	295	5.3	200	4.1	100	3.0		3.5
13	280	5.1	200	4.1	100	2.9	3.1	3.5
14	275	5.4	200	4.0	100	2.8	3.0	3.5
15	290	5.0	205	3.9	100	2.6	3.2	3.5
16	270	5.1	215	3.2	105	2.3	2.5	3.4
17	240	5.4	220	---	120	1.9	2.4	3.4
18	225	5.9	---	---	---	E	2.1	3.4
19	225	5.5					2.5	3.3
20	220	4.9						3.4
21	220	3.9						3.2
22	245	3.4						3.2
23	270	3.0						3.1

Time: 0.0°.
Sweep: 1.4 Mc to 11.2 Mc in 6 minutes.

Table 19

Graz, Austria (47.1°N, 15.5°E) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.5						
01	300	3.4						
02	300	3.1						
03	300	3.1						
04	300	2.9						
05	270	2.7						
06	250	3.5						
07	250	4.2	220	3.5				
08	250	4.9	200	3.7				
09	270	5.4	200	3.9		2.9	3.5	
10	270	5.3	200	4.0		3.1	3.8	
11	280	5.7	200	4.1		3.2	3.4	
12	280	5.2	200	4.2		3.3	3.1	
13	260	5.4	200	4.2		3.3		
14	270	5.2	200	3.9		3.1		
15	250	5.2	200	3.8				
16	230	5.1	220	3.7				
17	240	5.2						
18	240	5.5						
19	250	5.7						
20	240	5.1						
21	250	4.5						
22	265	3.9						
23	290	3.7						

Time: 15.0°E.
Sweep: 2.5 Mc to 12.0 Mc in 2 minutes.

Table 20

Schwarzenburg, Switzerland (46.8°N, 7.3°E) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.2						3.2
01	300	3.3						3.2
02	300	3.1						3.2
03	300	3.0						3.2
04	300	2.8						3.3
05	290	2.8						3.3
06	240	2.9						3.6
07	200	3.8			100	2.0		3.7
08	200	4.4	200	3.5	100	2.2		3.8
09	300	4.5	200	3.9	100	2.6		3.6
10	280	5.2	200	4.0	100	2.8		3.6
11	300	5.5	200	4.0	100	3.0		3.6
12	290	5.5	200	4.1	100	3.0		3.6
13	300	5.4	200	4.1	100	3.0		3.5
14	300	5.2	200	4.0	100	3.0		3.5
15	290	5.3	200	4.0	100	2.8		3.8
16	260	5.2	200	3.9	100	2.6		3.6
17	210	5.0	—	—	100	2.3		3.6
18	220	5.2	—	—	—	—		3.5
19	210	5.8						3.6
20	210	5.6						3.6
21	210	4.9						3.5
22	230	4.0						3.4
23	250	3.5						3.3

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 21

Formosa, China (25.0°N, 121.5°E) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	4.2					2.6	2.9
01	280	4.0					2.5	3.0
02	240	3.5					2.3	3.1
03	230	3.2					2.2	3.4
04	250	2.6					3.0	2.8
05	280	3.8					2.2	(2.8)
06	240	4.7			—	—	2.4	3.4
07	230	6.5	230	—	110	2.2	3.7	3.7
08	240	6.2	220	4.0	105	2.6	4.4	3.4
09	270	6.7	210	4.4	100	3.0	4.5	3.4
10	290	7.1	210	4.6	—	—	4.6	3.2
11	320	8.8	200	4.6	—	—	4.7	3.1
12	320	10.3	300	4.6	—	—	4.3	3.0
13	330	>11.4	210	4.5	—	—	4.3	3.2
14	310	10.8	215	4.5	—	—	3.9	3.2
15	300	10.8	240	4.4	120	(3.1)	4.3	3.3
16	280	>11.5	240	4.0	110	2.7	4.5	3.3
17	260	>11.2	240	3.7	—	—	4.2	3.5
18	220	11.3			—	—	3.7	3.5
19	210	8.6					3.3	3.6
20	210	5.6					3.2	3.3
21	260	4.7					3.1	3.1
22	280	4.6					3.8	3.0
23	300	4.3					3.4	3.0

Time: 120.0°E.
Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Table 22

Leopoldville, Belgian Congo (4.3°S, 15.3°E) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	225	4.8						2.1
01	250	3.6					1.8	1.9
02	260	3.1					2.0	2.1
03	245	2.9					1.9	2.3
04	240	2.5					2.0	2.4
05	240	4.5			—	—	2.7	2.4
06	250	5.3	235	—	125	2.4	3.5	2.5
07	270	7.0	225	(4.2)	120	2.9	4.0	2.3
08	290	7.8	220	4.4	120	3.2	4.1	2.2
09	300	8.4	210	4.5	115	3.4	4.4	2.1
10	320	9.0	200	4.5	115	3.4	4.6	1.9
11	320	9.4	200	4.5	115	3.5	4.1	2.0
12	320	10.0	200	4.5	115	3.5	3.6	1.9
13	320	9.5	200	4.4	115	3.3	3.9	1.9
14	340	9.6	230	4.4	120	3.0	4.0	1.8
15	325	9.7	250	(4.2)	120	2.7	3.6	1.9
16	280	10.0	250	—	120	2.1	3.0	2.0
17	260	10.2					3.1	2.0
18	245	10.9					3.0	2.2
19	225	10.4					3.0	2.2
20	210	8.9					2.4	2.5
21	210	7.0						2.4
22	210	6.0						2.2
23	220	5.3						2.1

Time: 0.0°.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 23

Huancayo, Peru (12.0 S, 75.3°W) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	220	5.8						3.3
01	230	6.1						3.3
02	240	4.9						3.2
03	250	4.4						3.3
04	270	3.6						3.2
05	270	2.8						3.3
06	260	3.7			130	1.3	2.2	3.1
07	(280)	6.4	230	—	110	2.3	6.3	3.2
08	300	7.5	220	4.1	110	2.7	11.2	2.9
09	340	7.6	200	4.3	100	—	12.1	2.7
10	360	7.1	200	4.4	100	—	13.0	2.5
11	380	6.8	200	4.4	100	—	13.0	2.5
12	380	6.8	190	4.5	100	—	13.0	2.5
13	370	7.3	190	4.4	100	—	12.8	2.6
14	340	7.5	190	4.4	100	—	12.0	2.6
15	320	7.8	190	4.3	110	—	10.8	2.6
16	(290)	8.0	190	—	110	—	9.5	2.5
17	240	8.2	230	—	110	2.2	5.7	2.8
18	260	8.5			110	—		2.9
19	280	8.2						2.8
20	270	7.8						3.0
21	240	7.4						3.2
22	220	7.4						3.3
23	220	7.3						3.3

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 24

Buenos Aires, Argentina (34.5°S, 58.5°W) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	3.4						2.7
01	300	3.5						2.8
02	280	3.6						3.0
03	240	3.5						3.3
04	250	2.6						3.2
05	270	2.6						3.0
06	240	3.9	—	—	150	1.9		3.3
07	240	5.2	220	—	130	2.4	2.7	3.4
08	260	5.8	220	3.4	110	2.8	3.2	3.3
09	280	6.0	220	(3.8)	110	2.9	3.6	3.2
10	290	7.2	210	4.3	110	3.1	3.9	3.2
11	300	8.0	200	4.3	100	3.1	4.2	3.1
12	290	10.0	200	4.2	110	3.1	4.0	3.2
13	270	9.5	200	4.2	100	3.1	3.9	3.3
14	260	8.5	200	4.0	110	3.1	3.4	3.3
15	260	8.4	220	—	110	3.0	3.5	3.3
16	240	7.5	220	—	—	—	2.7	3.4
17	230	7.0	230	—				3.4
18	220	6.2						3.5
19	230	4.5						3.2
20	260	3.9						2.9
21	270	3.6						2.9
22	300	3.6						2.8
23	330	3.5						2.8

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 25

Decepcion I. (63.0°S, 60.7°W) September 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	3.0						3.0
01	310	3.0						3.0
02	310	3.0						3.0
03	310	2.9						3.0
04	300	3.0						3.0
05	300	2.9						3.1
06	240	3.6						3.4
07	220	4.2						3.5
08	220	4.5					2.5	(3.7)
09								
10	220	5.6					2.8	(3.7)
11	220	5.8					3.0	(3.6)
12								
13	220	5.8					2.8	(3.6)
14	220	5.4					3.0	(3.6)
15	220	5.2					2.0	3.6
16	220	5.0					2.0	(3.8)
17	220	4.8						3.6
18	220	4.6						3.5
19	240	4.4						3.4
20	260	4.2						3.2
21	280	3.7						3.2
22	300	3.2						3.1
23	300	3.1						3.0

Time: 60.0°W.
Sweep: 1.5 Mc to 16.0 Mc in 15 minutes, manual operation.

Table 26

Kiruna, Sweden (67.8°N, 20.5°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	275	3.5					3.7	3.1
01	285	3.6					3.8	3.0
02	305	3.4					3.0	3.0
03	285	3.4					2.8	2.8
04	305	3.5	—	2.9	—	—	2.1	2.9
05	440	3.8	240	3.2	115	2.0		2.8
06	425	4.0	230	3.7	120	2.3		2.8
07	460	4.2	220	3.8	115	2.6		2.7
08	440	4.4	210	3.9	110	2.8		2.9
09	400	4.7	220	4.0	110	2.9		2.9
10	380	4.9	210	4.0	110	3.0		2.9
11	375	4.9	210	4.0	110	3.0		3.0
12	390	4.8	210	4.1	105	3.0		2.8
13	390	4.7	210	4.0	110	3.0		2.9
14	395	4.7	210	4.0	110	3.0		3.0
15	435	4.4	230	3.9	110	2.8		3.0
16	370	4.5	230	3.8	115	2.6		3.0
17	320	4.4	240	3.7	120	2.3		3.0
18	300	4.2	250	3.5	130	2.1	2.1	3.0
19	260	4.1	—	—	130	2.0	3.2	3.1
20	255	4.2					4.3	3.1
21	275	3.9					4.2	3.1
22	(260)	4.0					4.2	3.1
23	280	3.8					4.1	3.1

Time: 15.0°E.
Sweep: 0.8 Mc to 15.0 Mc in 30 seconds.

Table 27

Lulea, Sweden (65.6°N, 22.1°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	2.4					2.9	
01								
02	(290)	(2.5)					3.3	
03								
04	(250)	3.0	—	—	—	—	1.9	
05								
06	255	3.5	210	2.8	115	2.3	2.4	
07								
08	400	4.3	210	3.7	105	2.7	2.2	
09								
10	365	4.5	210	4.0	105	2.8	3.1	
11								
12	360	4.6	205	4.0	105	3.0	2.6	
13								
14	(350)	(4.5)	210	4.0	110	2.8		
15								
16	340	4.4	220	3.6	110	2.6	2.8	
17								
18	285	4.0	240	3.0	120	2.1	2.6	
19								
20	270	3.0	—	—	—	—	1.8	
21								
22	(270)	(2.8)					2.5	
23								

Time: 15.0°E.
Sweep: 1.5 Mc to 10.0 Mc in 6 minutes, automatic operation.

Table 28

Lindau/Harz, Germany (51.6°N, 10.1°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	3.2					2.4	3.1
01	260	2.9					2.4	3.1
02	265	2.8					2.5	3.0
03	280	2.4					2.5	3.1
04	270	2.4			—	E	2.8	3.1
05	280	3.0	—	—	—	E	3.0	3.2
06	280	3.7	230	3.2	120	1.8	3.2	3.3
07	370	4.2	220	3.5	110	2.2	3.4	3.1
08	360	4.3	210	3.8	105	2.5	3.7	3.1
09	365	4.7	205	3.9	100	2.8	4.2	3.1
10	355	4.7	205	4.1	100	2.9	4.3	3.2
11	350	4.7	200	4.2	100	2.9	4.4	3.1
12	350	4.9	200	4.2	100	2.9	4.4	3.2
13	380	4.7	200	4.2	100	3.0	4.2	3.0
14	335	4.9	200	4.2	100	3.0	4.3	3.2
15	350	4.8	205	4.1	100	2.8	4.2	3.2
16	350	4.6	215	3.9	100	2.8	3.6	3.2
17	345	4.6	225	3.7	110	2.5	3.8	3.1
18	305	4.7	225	3.5	115	2.1	3.9	3.2
19	265	5.0	230	—	—	E	3.6	3.2
20	250	5.4	—	—	—	E	3.5	3.2
21	240	5.2					3.2	3.2
22	240	4.8					2.9	3.3
23	250	3.8					3.1	3.2

Time: 15.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 8 minutes.

Table 29

Graz, Austria (47.1°N, 15.5°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.5						
01	300	3.2						
02	300	3.0						
03	300	2.9						
04	300	2.9						
05	295	3.2						
06	240	3.8					3.4	
07	280	4.3	220	3.7			4.3	
08	300	4.9	200	3.9			4.0	
09	300	5.0	200	4.0			4.2	
10	300	5.2	200	4.0			4.8	
11	300	5.1	200	4.2			4.0	
12	300	5.0	190	4.2			3.6	
13	310	5.3	200	4.3			4.0	
14	300	5.0	200	4.1			3.8	
15	300	5.0	200	4.0			3.6	
16	305	5.0	210	4.0			3.7	
17	290	5.0	220	3.8			4.0	
18	280	5.0	250	3.4			4.0	
19	250	5.9					3.8	
20	240	5.8					4.0	
21	245	5.3					4.0	
22	250	4.3						
23	245	4.1						

Time: 15.0°E.
Sweep: 2.5 Mc to 12.0 Mc in 2 minutes.

Table 30

Formosa, China (25.0°N, 121.5°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.9					3.4	2.8
01	280	3.9					3.2	3.0
02	280	3.7					2.9	(2.9)
03	260	3.2					3.0	3.1
04	270	3.2					2.7	3.1
05	260	3.2					3.2	3.2
06	240	4.5			—	—	3.3	3.3
07	240	5.8	220	3.6	110	2.3	3.8	3.6
08	280	5.6	220	4.1	105	2.7	5.6	3.2
09	310	5.6	210	4.3	110	3.0	5.4	3.2
10	340	5.5	210	4.5	—	—	6.2	3.0
11	400	6.2	220	4.4	—	—	5.3	2.8
12	360	7.4	230	4.6	—	—	5.6	2.8
13	350	7.4	220	4.5	120	—	5.6	2.8
14	390	7.7	230	4.4	—	—	5.7	2.8
15	360	8.3	240	4.4	—	—	5.5	2.9
16	320	8.8	220	4.1	—	—	4.8	3.1
17	290	9.0	240	3.9	—	—	4.6	3.2
18	250	8.6	—	—	—	—	4.5	3.3
19	220	8.6					4.3	3.6
20	240	5.7					4.2	3.2
21	240	4.6					3.3	3.2
22	280	4.1					3.4	2.9
23	320	3.9					3.4	2.9

Time: 120.0°E.
Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Table 31

Baguio, P.I. (16.4°N, 120.6°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	3.8						2.8
01	300	(3.4)					2.7	(2.8)
02	270	3.3					1.6	3.0
03	250	(3.2)					1.6	(3.1)
04	250	(2.7)					1.6	(3.4)
05	240	2.7					2.0	3.4
06	240	4.1					2.6	3.4
07	220	5.5	—	—	110	—	5.0	3.3
08	200	6.1	210	—	110	2.7	6.0	3.1
09	250	6.8	200	4.1	110	3.1	5.6	2.9
10	320	7.4	200	4.2	110	3.2	5.6	2.6
11	390	8.1	200	4.3	110	3.3	5.6	2.8
12	390	8.4	210	4.3	110	3.4	5.4	2.6
13	390	8.4	200	4.2	110	3.4	5.4	2.6
14	380	9.0	200	4.2	110	3.2	5.8	2.7
15	380	9.1	210	4.1	110	3.0	5.6	2.8
16	350	9.6	210	—	110	(2.7)	5.4	2.8
17	300	(10.2)	220	—	—	—	5.2	(3.0)
18	250	(10.4)					5.0	(3.1)
19	220	8.8					4.6	3.2
20	220	7.1					4.0	3.1
21	250	5.8					3.1	3.0
22	280	5.1					3.6	2.9
23	300	4.2					2.2	2.8

Time: 120.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 32

Johannesburg, Union of S. Africa (26.2°S, 28.1°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	240	2.8						3.2
01	250	2.8						3.2
02	250	2.7						3.1
03	250	2.8					2.0	3.3
04	240	2.5					1.7	3.3
05	260	2.2					3.4	3.1
06	250	2.5					1.5	3.2
07	220	4.5			—	2.0		3.6
08	240	5.1	220	3.4	120	2.4		3.6
09	270	5.5	220	4.0	110	2.7		3.4
10	280	5.9	220	4.2	110	3.0		3.4
11	280	8.3	210	4.3	110	3.1		3.3
12	290	6.4	210	4.3	110	3.2		3.3
13	280	6.5	200	4.2	110	3.1	3.9	3.5
14	280	8.0	200	4.2	110	3.0	3.9	3.3
15	260	6.4	200	4.0	110	2.8	3.7	3.4
16	250	8.2	210	3.6	110	2.5	3.2	3.4
17	230	5.5	220	—	120	2.0	2.6	3.4
18	220	4.9					1.8	3.4
19	220	3.9						3.4
20	240	3.1						3.3
21	240	3.1						3.2
22	240	3.1						3.2
23	240	3.0						3.2

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 33

Watheroo, W. Australia (30.3°S, 115.9°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	3.1						3.0
01	250	3.2					2.0	3.0
02	250	3.2					2.4	3.0
03	250	3.3					2.4	3.0
04	250	3.3					2.3	3.1
05	250	3.0					2.2	3.2
06	250	2.7				—	2.1	3.1
07	250	3.6	210	—		1.7		3.3
08	250	4.8	250	3.4		2.2		3.4
09	280	5.2	240	3.8		2.6		3.4
10	300	5.4	240	4.2		2.9		3.3
11	300	5.6	230	4.2		3.1		3.4
12	290	5.8	220	4.3		3.0		3.3
13	300	5.7	230	4.2		3.1	3.4	3.2
14	300	5.8	220	4.1		3.1	3.4	3.2
15	290	5.8	220	4.0		2.8	3.0	3.3
16	260	5.5	230	3.6		2.5	2.8	3.4
17	250	5.1	230	2.9		2.0		3.3
18	240	4.1				1.4	1.8	3.3
19	240	3.8					2.4	3.3
20	240	3.1					2.0	3.1
21	250	3.1						3.0
22	260	3.2						3.0
23	250	3.2					1.8	3.1

Time: 120.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 2 minutes.

Table 34

Capetown, Union of S. Africa (34.2°S, 18.3°E) August 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	2.7						3.1
01	250	2.6						3.2
02	260	2.7						3.1
03	250	2.8						3.1
04	250	2.8						3.3
05	240	2.5						3.2
06	260	2.5						3.1
07	250	2.9						3.2
08	230	4.2	—	—	130	1.9		3.5
09	250	5.0	230	3.0	120	2.4		3.5
10	270	5.2	220	3.9	120	2.7		3.4
11	290	5.4	220	4.0	110	2.9		3.3
12	300	6.0	210	4.1	110	3.0		3.2
13	300	6.0	210	4.1	110	3.0		3.2
14	290	6.4	210	4.0	120	3.0	3.4	3.2
15	270	6.5	220	4.0	120	2.9	3.4	3.3
16	260	6.1	220	3.8	120	2.6	3.2	3.4
17	240	6.0	220	3.1	120	2.2	2.6	3.4
18	230	5.2	—	—	—	—	2.5	3.4
19	220	3.9						3.4
20	240	2.9						3.3
21	240	3.0						3.3
22	240	2.8						3.3
23	250	2.8						3.2

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 35

Godhavn, Greenland (69.2°N, 53.5°W) July 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	(3.4)	240	—	—	—	1.8	3.2
01	260	(3.4)	230	—	—	—	1.7	(3.2)
02	(280)	(3.3)	230	—	—	—	1.7	(3.2)
03	—	(3.3)	(220)	—	—	—	1.8	(3.3)
04	(400)	(3.3)	(220)	(2.8)	—	(1.8)	3.4	(3.2)
05	—	(3.6)	(210)	(3.0)	(110)	(1.8)	3.3	(3.3)
06	G	(3.4)	(200)	(3.2)	110	2.1	2.6	(3.3)
07	G	< 3.5	(200)	(3.4)	100	2.3	3.6	G
08	—	—	(200)	(3.4)	100	(2.5)	3.3	—
09	—	—	(210)	(3.6)	(100)	2.6	3.8	—
10	(400)	(4.4)	(210)	(3.8)	100	2.7	3.2	(2.9)
11	(380)	(4.5)	210	(3.8)	(100)	(2.8)	3.6	(3.0)
12	(400)	(4.5)	210	(3.9)	100	2.8		(2.9)
13	(420)	(4.4)	(210)	(3.9)	100	2.8	6.3	(2.7)
14	350	4.5	(210)	3.8	(100)	2.8	6.2	3.0
15	(400)	(4.3)	210	3.8	100	2.7	8.7	(2.8)
16	(390)	(4.2)	210	(3.7)	100	2.6	5.8	(3.0)
17	(420)	(4.2)	210	(3.6)	100	(2.5)	6.1	(2.8)
18	(380)	(4.1)	220	3.5	100	2.4	4.8	3.0
19	340	(4.0)	220	3.4	—	(2.2)	5.0	3.2
20	—	(3.8)	220	—	—	—	5.4	(3.2)
21	—	(3.7)	230	—	—	—	4.8	3.3
22	(270)	(3.5)	230	—	—	(1.7)	3.0	3.3
23	260	3.3	230	—	(130)	(1.6)	1.8	3.3

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 36

Graz, Austria (47.1°N, 15.5°E) July 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.8						
01	290	3.8						
02	280	3.4						
03	290	3.2						
04	290	3.0						
05	250	3.8						
06	250	4.1	220	3.5			3.5	
07	325	(4.6)	205	3.9			4.1	
08	320	(5.0)	200	3.9	—	—	4.5	
09	300	4.9	200	4.0	—	—	5.0	
10	315	5.0	200	4.1	—	—	5.0	
11	300	5.2	200	4.2	—	—	4.8	
12	340	5.2	200	4.3	—	—	4.9	
13	310	5.1	200	4.2	—	—	4.4	
14	330	5.0	200	4.2	—	—	3.8	
15	320	5.0	200	4.0	—	—	4.0	
16	300	4.9	200	3.9	—	—	4.0	
17	310	5.0	200	3.8			4.1	
18	280	5.0	240	3.5			4.0	
19	255	5.0					4.0	
20	240	5.8						
21	230	5.2					4.6	
22	250	4.7						
23	250	4.2						

Time: 15.0°E.
Sweep: 2.5 Mc to 12.0 Mc in 2 minutes.

Table 37

[illegible]anesburg, Union of South Africa (26.2°S, 28.1°E) — July 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
[illegible]	230	2.6						3.2
[illegible]	250	2.5					3.1	3.1
[illegible]	230	2.5						3.1
[illegible]	[illegible]	2.7						3.3
[illegible]	[illegible]	2.4					1.9	3.2
[illegible]	[illegible]	2.2					3.2	3.2
[illegible]	[illegible]	[illegible]					3.0	3.3
[illegible]	22[illegible]	3.7			—	1.7		3.5
[illegible]	230	5.0	220	—	120	2.1		3.6
0[illegible]	[illegible]	5.4	220	3.7	110	2.6		3.5
[illegible]	[illegible]	5.7	210	4.0	110	2.6		3.4
[illegible]	[illegible]	5.5	210	4.1	110	3.0	3.2	3.4
[illegible]	[illegible]	5.8	210	4.2	110	3.1	3.4	3.4
13	270	6.0	200	4.1	110	3.1	3.7	3.4
[illegible]	[illegible]	[illegible]	[illegible]	4.0	110	3.0	3.7	3.4
15	[illegible]	[illegible]	210	3.8	110	2.7	3.3	3.4
[illegible]	[illegible]	[illegible]	220	3.2	110	2.4	2.9	3.4
[illegible]	[illegible]	5.[illegible]	—	—	130	1.9		3.5
[illegible]	[illegible]	[illegible]						3.5
[illegible]	[illegible]	2.8					1.9	3.4
[illegible]	[illegible]	2.5					2.0	3.1
[illegible]	[illegible]	2.9						3.2
[illegible]	[illegible]	[illegible]						3.3
[illegible]	[illegible]	3.0						3.3

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 38

Capetown, Union of [illegible] Africa ([illegible].2°S, 18.3°E) — July 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	2.6						3.1
01	260	2.6						3.1
02	270	2.6						3.1
03	250	2.6						3.1
04	260	2.7						3.2
05	240	2.6						3.2
06	240	2.3					2.0	3.2
07	250	2.0					3.0	3.2
08	220	3.8	—	—	—	1.7		3.5
09	230	4.8	230	2.8	120	2.1		3.6
10	250	[illegible]	[illegible]	3.6	120	2.5		3.5
11	260	5.5	22[illegible]	3.9	120	2.8		3.4
12	270	5.6	210	4.0	120	2.9		3.3
13	280	5.8	210	4.0	120	2.9	3.2	3.3
14	270	6.1	220	4.0	110	2.9	3.2	3.3
15	270	6.2	220	3.8	120	2.7	3.3	3.3
16	250	6.1	220	3.4	120	2.4		3.4
17	230	5.4	220	2.6	130	2.0	2.6	3.5
18	22[illegible]	4[illegible]			—	1.4	2.3	3.5
19	220	2.8					2.2	3.4
20	240	2.3					2.1	3.2
21	250	2.6					1.6	3.3
22	240	2.8						3.3
23	250	2.6						3.3

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 39

Godhavn, Greenland (69.2°N, 53.5°W) — June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
[illegible]	[illegible]	3.6	220	—	(130)	1.5	1.7	3.3
[illegible]	[illegible]	3.4	230	—	—	(1.4)	1.7	(3.3)
[illegible]	([illegible])	(3.4)	(220)	—	120	—	1.8	(3.3)
0[illegible]	(2[illegible])	(3.5	(210)	(2.8)	110	(1.6)	3.0	(3.3)
[illegible]	([illegible])	(3.6)	(200)	(3.0)	110	(1.8)	2.8	(3.3)
[illegible]	—	(3.7)	(200)	(3.2)	110	(2.0)	4.0	(3.3)
06	—	(4.0)	(200)	(3.5)	110	2.3	4.8	—
0[illegible]	—	(4.[illegible])	(200)	(3.5)	100	(2.4)	4.4	(2.7)
[illegible]	—	(4.4)	(210)	(3.6)	100	(2.6)	4.6	—
[illegible]	([illegible])	(4.6)	200	(3.8)	(100)	(2.7)	4.0	(3.2)
[illegible]	([illegible])	(4.6)	200	3.9	100	2.8	4.1	(3.0)
11	390	(4.6)	200	(4.0)	100	2.9	3.2	(3.0)
12	(380)	(4.3)	200	4.0	(100)	2.9	3.8	3.0
13	(400)	(4.7)	(200)	(4.0)	100	2.9	6.8	(3.0)
14	(360)	(4.7)	(200)	(4.0)	100	2.8	7.9	(3.1)
15	(380)	(4.6)	200	3.9	100	2.8	6.4	(3.0)
16	(380)	(4.3)	200	3.8	100	2.7	5.1	(3.1)
[illegible]	380	(4.4)	200	3.7	(100)	2.5	4.8	(3.0)
18	340	(4.3)	210	3.5	(100)	2.5	4.4	(3.1)
[illegible]	330	(4.0)	210	3.5	(100)	(2.4)	4.1	(3.2)
20	300	(4.0)	210	3.3	—	(2.3)	4.4	(3.3)
[illegible]	280	3.9	210	(3.1)	(110)	2.0	2.2	3.3
[illegible]	240	3.7	220	—	(130)	(1.8)	2.0	3.4
23	280	3.6	230	—	—	(1.7)	1.9	3.3

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 40

Godhavn, Greenland (69.2°N, 53.5°W) — May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	3.4	240	—	—	—		3.2
01	260	(3.3)	230	—	—	—		3.2
02	(270)	(3.3)	230	—	—	—		(3.2)
03	270	(3.3)	(230)	—	—	—		(3.2)
04	(260)	(3.4)	230	—	—	(1.9)	2.0	(3.2)
05	—	(3.5)	(230)	(2.8)	<120	1.8	2.2	(3.3)
06	—	(3.7)	(210)	(3.3)	110	(2.2)	3.9	(3.4)
07	—	(4.0)	(220)	3.4	110	2.4	3.9	(3.3)
08	—	(3.8)	(210)	(3.6)	110	(2.6)	4.2	—
09	(380)	(4.4)	(220)	(3.7)	110	2.7	3.0	(3.0)
10	(360)	(4.6)	220	(3.8)	100	2.8	3.5	(3.0)
11	(390)	(4.6)	220	(3.8)	100	2.8		(2.9)
12	(380)	(4.5)	(220)	(3.9)	(100)	2.9		(2.9)
13	<380	(4.5)	210	3.9	<110	2.9		(3.0)
14	(380)	(4.5)	(210)	(3.9)	(100)	2.8	5.0	(2.9)
15	(380)	(4.4)	220	3.8	100	2.7	3.2	(3.0)
16	400	(4.3)	210	3.7	100	2.6	3.6	(2.9)
17	(360)	(4.2)	210	3.6	100	2.5	3.1	(3.0)
18	350	(4.2)	220	3.5	(100)	(2.3)	2.7	(3.1)
19	320	(4.0)	230	(3.3)	—	—	4.4	(3.2)
20	280	(3.8)	230	(3.2)	—	—	5.6	3.2
21	250	(3.8)	240	—	120	(1.7)	2.0	(3.3)
22	240	(3.6)	240	—	<120	1.7		3.3
23	250	(3.4)	230	—	—	—		(3.2)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 41

[illegible]javik, Iceland (64.1°N, 21.8°W) — May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
[illegible]	([illegible])	(3.3)					4.9	(3.2)
01	(330)	(3.0)					4.8	(2.8)
[illegible]	([illegible])	(2.6)					4.6	(3.0)
[illegible]	([illegible])	3.0					4.4	(3.1)
[illegible]	[illegible]	2.0	—	—	—	—	4.2	3.1
[illegible]	[illegible]	3.4	220	3.2	100	—	3.6	3.1
06	[illegible]20	3.8	210	3.4	110	2.1		3.3
07	[illegible]70	4.0	200	3.5	100	2.3		3.0
[illegible]	370	4.2	200	3.7	100	2.6		3.1
[illegible]	[illegible]	4.3	200	3.8	100	2.8		3.0
10	[illegible]	4.4	200	3.9	100	2.8		2.9
11	[illegible]	4.5	200	4.0	100	2.9		2.9
[illegible]	[illegible]	4.5	200	4.0	100	3.0		3.0
13	400	4.6	210	4.0	100	3.0		3.0
14	[illegible]	4.5	200	3.9	100	2.9		2.9
[illegible]	[illegible]	4.4	210	3.9	100	2.8		2.9
[illegible]	[illegible]	[illegible]	210	3.8	100	2.7		2.9
[illegible]	[illegible]	4.3	220	3.7	100	2.5	3.0	3.0
[illegible]	[illegible]	4.2	220	3.5	110	2.2	4.1	3.0
[illegible]	[illegible]	[illegible]	220	3.4	110	2.0	3.9	3.1
[illegible]	[illegible]	4.0	—	—			4.1	3.2
21	[illegible]	3.0					4.9	3.2
[illegible]	280	3.7					4.6	3.1
[illegible]	([illegible])	(3.6)					5.0	(3.1)

Time: 15.[illegible]°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 42

Godhavn, Greenland (69.2°N, 53.5°W) — April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	(2.3)						(3.1)
01	260	(2.3)						(3.1)
02	280	(2.8)					2.5	(3.0)
03	230	(2.0)					3.1	(3.1)
04	230	(2.[illegible])	—	—			3.9	(3.0)
05	(280)	(2.[illegible])	([illegible])	—	—	—	4.5	(3.2)
06	(250)	(3.1)	(230)	—	—	—	4.0	(3.2)
07	—	(3.[illegible])	(230)	—	(120)	2.1	4.0	(3.3)
08	—	(3.7)	230	3.2	120	2.2	3.8	(3.2)
09	—	(4.2)	230	(3.5)	<120	2.5	3.0	—
10	(420)	(4.3)	230	3.6	(120)	(2.6)	3.0	(2.9)
11	(420)	(4.5)	(220)	3.6	(110)	2.6	3.2	(3.0)
12	(390)	(4.6)	(220)	3.7	(110)	2.6		(2.7)
13	(390)	(4.5)	220	(3.7)	(110)	2.7		(2.9)
14	(370)	(4.4)	220	3.6	110	2.6		(3.0)
15	(360)	(4.4)	220	3.5	(110)	2.5	2.6	(3.0)
16	(370)	(4.2)	220	3.5	110	2.4		(2.0)
17	(350)	(4.2)	230	3.[illegible]	(110)	2.4	3.7	(3.0)
18	310	4.0	240	3.3	—	—		3.2
19	280	3.9	250	—	—	—	3.4	3.1
20	260	(3.6)	(240)	—			5.0	(3.2)
21	260	(3.4)	—	—			2.2	(3.1)
22	260	(3.2)					2.2	(3.1)
23	250	3.0					3.2	(3.1)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 43

Godhavn, Greenland (69.2°N, 53.5°W) March 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	(2.5)						(3.0)
01	(270)	(2.5)						(3.1)
02	(290)	(2.5)						(3.0)
03	(280)	(2.4)					2.8	(3.0)
04	(310)	(2.5)					3.4	(3.0)
05	(270)	(2.3)					3.5	(3.1)
06	(260)	(2.8)			—	—	4.3	(3.1)
07	(270)	(3.0)	—	—	—	—	4.9	(3.2)
08	(260)	(3.3)	240	—	—	—	5.0	(3.3)
09	(320)	(3.7)	(230)	2.9	120	2.0	2.8	(3.3)
10	(330)	(4.2)	(230)	(3.2)	120	—	3.5	(3.2)
11	(320)	(4.2)	220	(3.3)	120	(2.3)	2.8	(3.2)
12	(360)	(4.3)	220	(3.4)	(120)	(2.4)	3.4	(3.0)
13	(360)	(4.3)	(230)	3.4	120	(2.4)	5.2	(3.2)
14	(360)	(4.1)	230	3.3	(120)	2.4		(3.1)
15	410	(4.0)	230	3.3	(120)	(2.2)		(3.0)
15	340	(3.7)	230	(3.2)	120	2.2		(3.1)
17	260	(3.9)	230	(3.0)	—	—	2.0	(3.3)
18	240	(3.6)	250	—	—	—	2.0	(3.2)
19	250	(3.4)			—	—	(4.9)	(3.2)
20	(250)	(3.2)						(3.2)
21	< 250	(3.0)					(5.4)	(3.3)
22	240	(2.8)						(3.2)
23	250	(2.5)						(3.1)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 44

Godhavn, Greenland (59.2°N, 53.5°W) February 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	(2.5)						(3.1)
01	270	(2.2)					3.0	(3.1)
02	(270)	(2.5)					2.6	(3.0)
03	(280)	(2.4)					3.2	(3.1)
04	(270)	(2.6)					3.4	(3.2)
05	(270)	(2.8)					3.4	—
06	(260)	(2.8)					3.9	(3.2)
07	(280)	(3.0)					4.8	(3.0)
08	(240)	(3.4)					4.4	(3.3)
09	(250)	(3.7)			—	—	4.8	(3.3)
10	(250)	(4.0)	—	—	—	—	3.0	(3.4)
11	250	(4.5)	(240)	—	—	—	2.1	(3.4)
12	(230)	(4.3)	(230)	—	—	—	4.7	(3.4)
13	(250)	(4.4)	230	3.0	—	—	6.2	(3.3)
14	(230)	(4.5)	220	—	—	—	5.0	(3.4)
15	(230)	(4.1)	250	—			3.6	(3.4)
16	240	(3.8)		—			3.7	(3.3)
17	240	(3.5)	—	—			5.6	(3.3)
18	240	(3.6)					5.0	(3.3)
19	(240)	(3.3)					(5.0)	(3.2)
20	(240)	(3.1)						(3.1)
21	250	(2.9)					4.2	(3.2)
22	250	(2.8)						(3.2)
23	240	(2.4)						(3.1)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 45

Godhavn, Greenland (69.2°N, 53.5°W) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	(2.4)					4.0	3.1
01	260	(2.4)					4.0	(3.1)
02	270	(2.4)					4.1	(3.1)
03	320	(2.5)					5.0	(3.0)
04	280	(2.6)					4.2	(3.1)
05	(250)	(2.8)					5.4	(3.2)
06	(240)	(2.8)					4.5	(3.3)
07	(240)	(3.0)					5.5	(3.2)
08	250	(2.9)					3.5	(3.1)
09	260	(3.2)					4.0	(3.0)
10	250	(3.3)					3.9	(3.3)
11	250	(4.2)					5.1	(3.2)
12	230	(4.0)					3.6	(3.3)
13	240	(4.2)					5.6	(3.2)
14	240	(4.0)					5.3	(3.2)
15	230	(3.8)					3.9	(3.4)
16	240	(3.5)					5.5	(3.2)
17	240	(3.6)					3.9	(3.2)
18	240	(3.7)					3.7	(3.2)
19	240	(3.6)					5.2	(3.2)
20	250	(3.2)					5.4	(3.2)
21	240	(3.0)					2.8	(3.2)
22	250	(2.8)					1.3	(3.2)
23	250	(2.6)					3.9	(3.2)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 46

Godhavn, Greenland (69.2°N, 53.5°W) December 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	(2.4)					3.8	(3.1)
01	(290)	(2.6)					4.9	(3.1)
02	(280)	(2.6)					3.9	(3.0)
03	280	(2.3)					3.8	(3.0)
04	(280)	(2.5)					3.8	(3.0)
05	(260)	(2.8)					4.6	(3.2)
06	(240)	(3.1)					4.8	(3.3)
07	(240)	(3.0)					4.9	—
08	(250)	(3.2)					4.1	(3.2)
09	(250)	(3.6)					4.5	(3.2)
10	(260)	(3.7)					4.5	(3.2)
11	(250)	(4.1)					4.3	(3.2)
12	250	(4.0)					3.6	(3.2)
13	(250)	(4.0)					5.0	(3.2)
14	(250)	(4.0)					4.4	(3.2)
15	(250)	(3.8)					5.0	(3.2)
16	(250)	(3.7)					4.5	(3.2)
17	(260)	(3.4)					4.2	(3.2)
18	240	(3.4)					4.6	(3.2)
19	(250)	(3.3)					5.6	(3.1)
20	(250)	(3.3)					4.9	(3.1)
21	260	(3.0)					4.6	(3.1)
22	(250)	(3.0)					4.2	(3.2)
23	270	(2.7)					1.7	(3.1)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 47

Godhavn, Greenland (69.2°N, 53.5°W) November 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	(2.6)					3.3	(3.0)
01	290	(2.5)					3.8	(3.0)
02	(280)	(2.7)					4.1	(3.0)
03	(280)	(2.5)					3.6	(3.0)
04	280	(2.8)					3.1	(3.0)
05	(270)	(2.8)					3.6	(3.0)
06	(250)	(2.8)					4.9	(3.2)
07	(260)	(3.0)					4.4	—
08	(260)	(3.5)					4.4	(3.2)
09	250	(3.6)	—	—	—	—	4.4	(3.2)
10	250	(4.0)	—	—	—	—	4.0	(3.3)
11	250	(4.3)	—	—	—	—	3.8	(3.3)
12	(240)	(4.4)	—	—	—	—	5.5	(3.2)
13	230	(4.3)	—	—	—	—	5.4	(3.4)
14	240	(4.4)	—	—	—	—	4.0	(3.3)
15	240	(4.1)	—	—	—	—	4.6	(3.2)
15	250	(4.0)					4.4	(3.3)
17	240	(3.6)					5.8	(3.2)
18	250	(3.5)					5.0	(3.2)
19	(260)	(3.5)					4.9	(3.0)
20	250	(3.3)					4.7	(3.1)
21	260	(3.1)					4.4	(3.1)
22	260	(2.9)					4.8	(3.1)
23	250	(2.7)					3.8	(3.1)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 48

Godhavn, Greenland (69.2°N, 53.5°W) July 1952*

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	—	3.5	260	—				3.1
01	—	3.5	260	—	—	—		3.0
02	(330)	(3.8)	260	(2.6)	—	—		(3.0)
03	(340)	(3.6)	250	(2.8)	—	—		(3.0)
04	G	(3.7)	240	3.0	—	—		(2.8)
05	(400)	(3.6)	220	(3.2)	110	—	3.4	(2.9)
06	—	(3.7)	(220)	3.4	100	(2.2)	2.0	—
07	G	< 3.5	220	3.5	—	—	3.5	G
08	—	—	—	3.7	—	—		—
09	—	—	200	3.8	—	—	(3.1)	—
10	(400)	(4.6)	200	(3.9)	100	2.9		—
11	(420)	(4.7)	210	(4.0)	100	(3.0)	2.5	(2.8)
12	(430)	(4.9)	210	(4.1)	100	3.0		(2.7)
13	(400)	(4.7)	200	(4.1)	100	(3.0)	3.0	(2.8)
14	(400)	(4.7)	(190)	(4.0)	100	2.8	8.0	(2.9)
15	330	(5.0)	200	4.0	100	(2.8)	6.1	(3.0)
16	(410)	(4.8)	200	(3.9)	100	2.7	7.0	(2.9)
17	420	(4.5)	210	3.8	100	2.6	5.6	(3.0)
18	390	4.5	210	3.6	—	—	5.5	2.9
19	400	4.3	220	3.5	—	—	3.7	3.0
20	—	(4.1)	340	3.4	—	—	3.9	3.0
21	—	4.0	240	—	—	—	3.4	3.1
22	—	3.8	250	—	—	—	3.6	3.1
23	—	3.7	260	—	—	—	4.7	3.0

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.
*Observations made 1st through 15th only.

Form adopted June 1946

TABLE 49

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

h'F2 (Characteristic), Km (Unit), November (Month), 1953

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C, E.J.W.

Calculated by: Mc C, E.J.W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(310)A	(320)S	[300]A	(280)A	(250)A	(270)S	[240]A	220	240	250	240H	300H	280	270	260	250	240	230	(260)A	250	270	260	(250)S	250
2	(290)S	(270)S	260	(270)A	250	(240)S	(230)S	240	220	240	250	(280)L	260	260H	250	250	230	220	220	230	(250)S	(260)S	(290)S	(300)A
3	260	(270)S	(260)S	(300)A	250	270	250	220	230	240	270	280	270	260	240H	230H	230	210	220	(250)S	(250)S	(250)S	(270)S	(260)S
4	270	(260)S	250	250	250	240	220	220	230	240	250	230	250	280	250	230	230	210	210	(280)H	(290)A	280	A	A
5	(270)S	25[illegible]	250	250	240K	<300EK	EK	250HK	240K	250K	430K	420K	350K	390K	310K	280K	250K	(230)AK	(240)SK	(250)SK	<340EK	FK	SK	<360SK
6	[300]AK	350SK	(290)SK	280K	270AK	(280)SK	(250)S	230	240	250	290	280	280	250	250	250	230	220	[290]A	(240)S	(270)A	(280)S	(280)S	(260)S
7	(260)S	[280]A	(290)S	(260)A	(2[illegible]0)S	(240)S	(230)S	240	230	250	250	[260]L	270	240	270	250	230	220	220	220	(240)S	270	A	A
8	A	A	A	(270)A	(260)A	(250)S	250	230	240	240	260	280	270	270	250	240	230	210	210	(230)S	250	(250)S	(260)S	(270)S
9	270	[illegible]	(270)A	250	250	230	220	220	230	240	250	250	260	250	250	240	230	210	230	240	(240)S	250	(270)S	(270)S
10	280	250	240	250	260	240	(230)S	210	230	240	230	240H	260	260	260	250	230	210	210	230	(260)S	(270)S	(280)S	(280)S
11	250	(270)S	250	260	260	(240)S	230	210	220	240	240	240	260	270	250	230	240	220	210	230	(270)S	(290)S	(280)S	(280)S
12	280	280	240	230	230	(250)S	(280)S	220	220	230	260	240	260	260	250	260	240	220	200	240	260	(290)S	(280)S	(300)S
13	(320)S	270	290	260	250	(250)S	[250]S	250	270	250	300	280	250	260	260	250	250	220	220	220	(250)A	A	A	A
14	(310)S	270	260	240	230	(240)S	(290)S	250	(260)A	310	270	270	280	270	260	250	240	200	230	230	250	(270)S	(320)SK	AK
15	AK	AK	SK	SK	AK	(280)SK	EK	250	240	290	300	270	260	250	250	230	220	220	230	230	(290)S	260	(310)S	(300)S
16	E	E	E	E	E	E	E	260	230	270	250	260H	270	270	270	240	230	210	200	250	250	E	E	280H
17	(270)S	250	260	240	250	(270)S	(260)S	240	240	250	250	240	250	250	250	240	230	200	210	(250)A	(240)A	(270)S	(290)S	(280)S
18	(290)S	260	(250)S	240	240	(240)S	(250)S	250	240	250	250	240	260	240	250	230	A	A	210	A	A	A	(310)S	<330E
19	[320]A	(260)S	(270)S	(270)A	(230)A	230	[230]A	230	230	250	290	290	260	250	260	240	240	230	(240)A	(250)A	(240)A	(280)S	(280)S	(280)S
20	(310)S	(290)S	270	240	220	A	A	230	240	260	250	250	250	250	250	240	220	220	220	(230)S	(260)S	(280)S	(280)S	<330S
21	(290)S	270	270	260	240	250	270	230	220	230	220	(260)A	250	240	240	240	220	200	240	(240)S	(260)SK	(300)SK	SK	EK
22	<330SK	FK	(280)FK	(250)FK	220K	220	230	230	240	240	230	260	270	240	230	230	220	200	(220)S	230	240S	250	(260)S	[280]S
23	(300)S	260	240	<300E	(320)F	(240)S	[240]A	240	230	230	260	250	260	250	250	250	230	220	230	210	230	250	(240)S	(280)S
24	(260)S	(270)S	270	250	230	210	(230)S	240	230	230	240	240	230	250	240	220	210	200	230	240	(250)S	(260)S	(280)S	280
25	(300)S	(280)S	250	230	220	230	(220)S	230	220	270	240	220	220	230	230	220	220	200	220	240	240	250	250	250
26	(260)S	(260)S	250	(240)S	230	220	220	230	210	230	230	240	240H	240	240	230	220	200	(220)S	(240)S	240	(250)S	(260)S	280
27	(280)S	(260)S	260	260	250	230	(240)S	230	220	230	210	240	260	240	250	230	220	200	220	240	(260)S	(280)S	(300)S	(280)S
28	(280)S	270	270	260	230	240	240	220	220	230	240	230	230	240	250	220	200	210	(230)S	250	(270)S	(280)S	[280]S	(290)S
29	(290)S	270	260	250	230	220	(260)S	230	220	220	(240)L	230	230	250	240	220	210	200	210	240	280	240	S	S
30	S	(280)S	260	240	230	240	(240)S	210	210	220	220	250	220	250	240	230	210	220	220	(230)S	(230)S	(270)S	(260)S	<340SY
31																								
Median	(280)	(270)	260	250	250	240	240	230	230	240	250	250	260	250	250	240	230	210	220	240	(250)	(270)	(280)	(280)
Count	26	27	28	28	29	28	28	30	30	30	30	30	30	30	30	30	29	29	30	29	28	26	23	21

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 50

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), November (Month), 1953

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C., E. J. W.

Calculated by: Mc C., E. J. W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.3	(2.1)F	[2.2]A	2.3	2.3F	2.1F	(1.9)FA	4.1	5.4	5.5	5.8H	5.5	6.4	6.2	6.3	6.2	6.0	5.8	4.8	3.4F	3.0F	2.8	2.8F	2.8F
2	(2.5)F	(2.7)F	(2.9)F	(3.2)SF	3.2F	3.2	3.1	4.9	5.6	5.7	5.8	5.8	6.9	6.9H	6.4	6.0	6.1	5.5	4.1	3.5	3.1	2.7	2.5	2.6F
3	2.7	(2.4)S	(2.4)SF	(2.2)F	2.5	2.8	3.0	4.5	5.5	5.8	5.8	6.2	6.4	7.0	6.4H	6.0H	5.9	5.3	3.7	3.3	2.9	2.8	2.7	2.7
4	2.7	2.8JF	3.0	3.1	3.2	3.3	3.1	4.9	5.6	6.0	6.4	(6.0)JS	6.6	6.9	7.0	6.2	6.2	5.5	3.7	2.8	2.8	2.9	[2.8]A	(2.8)A
5	3.3	3.2	2.9	2.9	2.6K	2.0K	K(1.7)JS	(3.2)HK	4.2K	4.3K	4.3K	4.7K	4.9K	4.6K	4.8K	4.6FK	K4.6JF	4.4K	3.5K	K2.6FS	K(1.8)PS	K[1.8]FS	K(1.7)JS	K(1.7)JB
6	K(1.6)JA	K(1.5)JS	K(2.5)PS	K(2.5)PF	K(2.4)PF	[2.5]FK	(2.6)PF	3.7F	5.0	5.0S	5.4	5.6	6.7	7.0	6.0	6.0	5.5	5.2	(4.2)PA	(3.6)PS	3.0F	2.6F	(2.7)PF	(2.5)PF
7	(2.3)PF	[2.6]F	(3.0)PF	(3.1)JF	(3.1)JF	(2.7)PF	(3.1)PF	4.4	5.4	5.7	5.7	5.4	6.1	6.2	5.6	5.8	5.5	5.2	4.2	3.7	2.6	2.2	(2.1)A	A
8	A	A	A	2.6F	2.4F	2.3F	2.5	4.5	5.1	5.8	5.9	6.0	6.4	6.6	7.0	6.7	6.3	5.4	4.6	3.2	2.8	2.4	2.4	2.5
9	2.6	2.7	3.0	3.0	3.1	3.1	2.7	4.3	5.5	5.7	6.1	6.4	6.1	6.9	6.5	6.4	6.0	4.6	3.6	3.2	3.0	2.6	2.4	2.5
10	2.7	2.9	2.8	3.0	3.2	3.2	3.1	4.1	5.4	5.7	(6.0)S	(6.1)JH	6.5	6.8	6.1	6.2	6.2	5.4	3.7	3.2	2.5	2.3	2.3	2.4
11	2.2	2.4	2.7	3.0	3.0	3.1JS	3.1	4.2	5.4	5.7	5.6	(5.8)S	6.2	6.8	6.4	5.8	6.5	5.8	3.8	3.1	2.7	2.6	2.8	2.9
12	3.0	3.2	3.4	3.0	2.6F	2.4F	2.0JF	4.0	5.1	6.0	6.0	6.8	6.8	7.0	7.0	6.7	6.8	7.0	5.8	4.2	(3.1)JF	(2.5)F	2.6F	2.7
13	2.7	2.9	(2.6)F	(3.3)SF	(2.7)F	2.1	(1.7)JS	3.4	4.6	4.8	5.5	5.4	6.0	6.0	6.4	6.2	5.8	6.1	5.2	(4.3)S	(2.2)A	A	A	(2.4)SP
14	(3.0)JS	(3.5)JS	(3.6)JS	(3.7)JS	(3.1)JS	2.3	2.2	3.3	4.4	4.6	5.3	5.4	5.8	5.8	6.7	6.4	6.6	(5.6)S	(4.7)S	3.6JS	(2.7)FS	(2.2)F	(2.4)SK	F K
15	A K	A K	(1.6)SK	K(1.7)JS	[1.6]AK	K(1.6)JS	<1.0EK	3.3	4.6	5.2	5.5	6.5	7.0	6.7	7.0	6.4	5.9	4.7	(4.0)JS	3.5	2.3F	(2.2)JF	(2.1)F	(2.3)JF
16	<1.0E	<1.0E	<1.0E	<1.0E	<1.0E	<1.0E	<1.0E	3.0	4.5	5.0	5.7	5.7H	5.6	6.0	6.8	6.6	5.5	4.8	4.2JS	(3.1)JS	2.4	1.8F	1.9JS	(1.9)JF
17	(2.3)F	(2.4)F	(2.7)F	(2.8)F	(2.7)FS	(2.6)FS	2.4FS	3.8	5.1	5.1	6.4	5.9	6.0JS	5.9	6.2	6.9	6.0S	5.0	4.2JS	3.3	3.1	2.4	2.3	2.2FS
18	2.4FS	(2.3)PF	3.2F	3.4FS	3.2	3.0FS	2.4F	3.5	4.6	5.3	5.5	5.7	6.4	6.5	6.1	6.3	5.3	(5.4)PA	3.3F	(2.8)PA	(2.6)A	(2.1)PF	(2.1)PA	(2.0)PA
19	[2.1]A	(2.6)PF	(2.7)PF	(2.8)PF	3.2FS	2.7V	1.9F	3.3	4.5	5.2	5.4	5.8	6.6	6.2	6.2	6.0S	5.2	(5.2)FS	(4.0)FS	(3.0)FS	2.9	2.3	2.3F	2.3F
20	(2.4)AF	(2.5)FS	(2.6)FS	2.8FS	2.4F	A S	A S	3.4S	5.2	5.7	6.7	6.2	6.3	6.5	7.0	6.4	5.7	5.1	4.4	3.0FS	2.3FS	(2.1)PF	(2.0)PF	(1.9)PF
21	(2.3)PF	2.8FS	[2.8]F	(2.9)PF	2.9	2.6F	(2.1)PF	(3.5)FS	5.2	5.8	6.2	5.8	7.0	7.2	6.8	6.6	6.0	4.7	3.3	2.5	K(2.4)PS	K(2.0)PS	F SK	<1.0EK
22	(1.8)SK	F K	F K	F K	F K	2.5FS	2.3F	3.6	5.3	5.7	6.1	6.0	6.5	6.0	6.2	6.1	6.3	5.1	3.5	3.0	2.4F	2.1F	(1.9)PF	(1.8)PF
23	2.6F	2.7FS	(2.8)FP	(1.4)PF	[1.6]F	(1.7)JS	[2.6]AF	3.5	5.1	5.8	6.0	7.0	6.2	7.8	7.2	6.6	7.4	7.6JS	6.0	(5.6)JS	(3.1)S	2.5F	2.5F	(2.5)F
24	(2.7)F	(2.3)F	(3.4)F	4.2	4.3	4.0	2.5	3.3	5.7	5.8	6.4	6.4	7.0	7.1	6.7	6.5	5.7	4.5	3.3FS	(2.9)FS	(2.7)S	2.3FS	2.2	2.2
25	(2.0)FS	2.6FS	3.2	3.3	3.2	3.2	(2.4)FS	3.5	6.6	7.0	6.2	6.8	6.8	6.4	6.6	6.5	5.6	4.9JS	4.2	3.6	3.3	3.0	3.0F	3.0FS
26	(2.3)PF	F	F	F	F S	3.5S	3.2	3.6	(5.5)FS	6.6	5.6	6.8	6.6H	6.9	6.7	5.7	6.1	6.0S	(3.4)PS	3.0JS	2.7F	(2.3)PS	(2.0)PF	(2.0)F
27	2.3F	(2.3)PF	2.4F	2.2	2.5	2.6	2.4	3.5	5.4	5.8JH	6.3	7.0	6.5	6.8	7.0Z	6.3H	6.0	4.7	3.5F	3.0F	2.5	2.2	2.3	2.1
28	2.4	2.6F	2.8F	3.2FS	3.3	(3.3)S	3.0FS	4.0	5.4	6.0	6.3	6.6	6.2H	6.7	6.4	6.2	5.5	5.0	3.3	2.8	2.4	2.1	1.8JS	2.0
29	2.2	2.8	3.1F	3.3	3.2	2.8	2.3	3.2JS	5.5	6.0	6.4	6.4	6.5	6.8	6.4H	5.8	5.2	4.5JH	3.3	2.6	2.2	2.1	(1.9)JS	1.8
30	1.7JS	(1.7)S	1.9	2.5F	2.7	3.0	(2.7)S	3.5FS	5.0	5.3	5.3	6.3	5.8	6.7	6.0	5.7	5.4	5.2	4.0	2.8	2.4	2.1	2.0	(1.8)S
31																								
Median	2.4	2.6	(2.8)	3.0	2.8	2.7	2.4	3.6	5.2	5.7	5.8	6.0	6.4	6.7	6.4	6.2	6.0	5.2	4.0	3.2	2.7	2.3	2.3	2.3
Count	28	26	27	28	28	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	28	28

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 51

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), November, 1953 (Month)

Observed at Washington, D. C.

Lat 38.7°N, Long. 77.1°W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C., E. J. W., J. W. P.

Calculated by: Mc C., E. J. W., J. W. P.

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330		
1	A	A	(2.4)FA	2.4	2.2F	2.0FS	(3.1)PA	4.6	5.0	5.5	5.8	5.9	6.5	6.4	6.4	6.0	5.8	5.4	4.0	3.3F	2.9	2.8F	(2.9)F	(2.5)F		
2	2.7	(3.0)F	(3.0)F	3.3	3.2	3.2	3.7	6.0	5.7	6.0	6.0	6.2	7.2	6.8	6.0	6.2	5.8	5.0	3.7	3.2	2.9	2.5	2.5	2.6F		
3	2.7	2.5	2.2	2.4	2.6	2.9	3.7	5.2	5.7	5.6H	6.2	6.2	6.6	6.9	6.1	6.1	5.6	4.6	3.4	3.2	3.0	2.7	2.7	2.6		
4	2.7F	1.9F	3.1	3.1	3.3	3.3	3.4	5.2	6.0	6.2	6.3	6.6	6.8H	7.0	6.8	6.4	6.2	4.7	3.1	(2.7)S	2.9	[3.0]A	3.0	3.1		
5	3.3	3.0	2.9	1.7	2.7K	2.0K	2.6K	4.0K	4.2K	4.3K	4.5K	5.0K	4.9K	4.8K	4.6K	4.6FK	K4.4FS	K(3.7)PS	3.1K	K(2.0)JF	AK	FSK	K(1.7)JS	K(1.6)JB		
6	K(1.6)JB	(2.1)FK	K(2.5)PF	K(2.4)PF	K(2.3)PF	K(2.5)PF	(2.7)PF	4.6	5.0	5.3	5.6	6.3	7.0	6.5F	5.9	5.8	5.4	4.7PS	(3.8)PS	[3.2]A	2.7A	2.6F	(2.7)PF	(2.5)PF		
7	F	A	(3.0)PF	(2.9)PF	(2.7)PF	(3.0)PF	3.3	4.9	5.2	5.8	5.3	5.9	6.6	5.6	5.7	5.8	5.2	4.9	4.1	3.0	2.3	2.2	2.1	A		
8	A	A	(2.5)A	2.5	(2.3)F	1.5	3.1	5.0	5.9	5.4	6.2	6.5	6.2	6.9	6.7	6.2	5.8	4.9	3.7	2.9	2.7	2.4	2.5	2.5		
9	2.7	2.8	3.0	3.1	3.2	3.0	3.2	5.0	5.7	5.8	6.3	6.0	6.6	6.9	6.6	6.0	5.4	3.9	3.3	3.0	2.7	2.5	2.5	2.5		
10	2.7	2.9	2.9	3.0	3.3	3.1	3.3	4.8	(5.1)PS	6.0	6.0	6.4	7.0	6.8	5.7	6.0	5.6	4.3	3.4JS	2.7	2.4	2.3	2.3	2.3JS		
11	2.3	2.5	2.8	3.0	3.1	3.1	3.2	5.1	5.4	5.9	6.2	5.9JH	6.6	6.6	5.8	6.2	6.6	4.9	3.3	2.8	2.7	2.8	2.8	2.9		
12	3.1	3.3	3.2	2.8F	2.4F	2.0F	2.7	5.1	5.4	5.6	6.2	6.5	7.2	[7.0]C	6.1	6.7	7.0	6.6	4.5	3.3F	(2.9)F	2.7	A	2.7		
13	3.0	2.5F	1.9F	(3.0)F	(2.4)SF	(2.4)S	(2.3)S	3.9	4.6	5.0	5.5	5.8	5.6	6.3	6.6JS	5.8	[6.0]C	5.8	4.4	(3.6)PS	AS	A	A	S(2.8)FJ		
14	(3.5)JS	(3.8)JS	(3.7)JS	(3.5)JS	2.7	2.2	2.5	3.9	4.6	5.0	5.5	5.6	6.1	6.4	6.6	6.2	6.3	(4.5)S	3.8	(3.1)FS	(2.6)SF	(2.3)F	(2.4)FK	AK		
15	AK	AK	K(1.6)JS	[1.6]AK	K(1.5)JS	K(1.6)JS	K2.0JF	4.1	4.7	5.6	6.1	6.4	6.8	6.4	6.8	6.6	5.0	4.7	4.0	2.5F	2.5	2.4	(1.9)F	(2.1)F		
16	<1.0E	<1.0E	<1.0E	<1.0E	<1.0E	<1.0E	2.0	3.7	4.9	5.6	5.7	6.0	5.8	6.0	7.1	5.9	5.4	(4.5)S	[3.6]S	(2.7)JS	1.9F	1.9F	(2.0)F	(2.1)F		
17	(2.6)J	(2.3)F	(2.8)F	2.6F	(2.6)S	(2.5)JS	(2.7)S	4.4	5.6	5.9	6.4	6.2	6.0JS	6.6	6.7	6.7	5.6	4.8	3.7	3.2	2.7	2.3	2.3	2.5		
18	(3.0)PF	3.2F	3.2	3.2F	3.1	2.8F	2.6	4.3	5.1	5.5	5.6	5.5	6.4	5.5	6.7	5.5	5.1	4.3	[2.8]A	A	A	(2.2)PF	[2.2]A	2.2		
19	(2.0)FS	[2.4]F	(2.7)PF	(3.3)FZ	2.9	2.1FS	2.4F	4.2	5.0	5.4	6.0	6.8	6.6	6.0	6.4	5.8	5.8	(4.9)S	(3.7)FS	(3.2)FS	[3.1]A	2.2	2.3F	2.2F		
20	[2.4]PA	[2.5]F	(2.7)F	2.7F	2.0	[2.1]A	(2.2)PS	4.5	(5.0)JH	6.3	6.8	5.6	6.3	6.4	6.6	6.4	5.3	5.0	3.8	2.7F	(2.0)FS	(2.3)PF	(1.9)PF	(2.3)PF		
21	(2.7)PF	3.0F	[3.1]F	3.2F	2.8F	(2.6)PF	[2.8]F	4.3	5.4JS	6.0	6.0H	6.8	6.9	6.6	6.4	6.0JS	6.1	3.8	(2.4)PF	1.5	2.1K	K(1.9)PS	<1.0E	1.7K		
22	K(1.9)PS	FK	FK	FK	K(3.0)JF	2.5	2.5	4.4	5.0	6.3	6.0	6.4	6.6	6.0	5.8	6.2	5.8	3.8	3.2	(2.7)PS	2.1F	1.9F	(1.7)PF	[2.2]F		
23	2.7	2.8F	[2.1]F	(1.4)PF	[1.5]F	(1.6)JS	[2.8]F	4.1	(5.6)PS	(5.2)JP	6.4	6.4	7.1	7.4	6.2	7.0	7.4	6.5	6.0JS	(4.2)JS	(3.1)SJ	(3.0)F	2.2F	2.6F		
24	(1.8)JF	(1.7)JF	3.9	4.2	4.2	3.2F	1.5F	4.7	6.2	6.4	6.5	7.0	6.2	6.8	6.4	5.8	5.2	3.8JS	3.2FS	1.8	(2.5)FS	2.2FS	2.2F	(2.1)F		
25	2.2	3.0	3.4FS	3.4	2.2	(3.1)JS	2.3	4.9	5.8	7.3JS	6.5JS	7.2	(7.2)PS	6.6	[6.6]C	6.0	5.7	4.8	3.7	3.5	3.1	3.0	3.0	(2.6)PF		
26	(2.4)PF	[2.6]F	(2.8)PF	[3.2]F	(3.6)FS	3.3	(2.8)JS	4.9	6.4	6.2	7.0	6.4	6.8F	6.7	6.4	6.1	6.0	(4.4)PS	3.5	2.9	2.5FS	(2.1)PF	(2.1)PF	2.2F		
27	(2.2)PF	2.2F	2.4	2.3	2.7	2.5	2.4	4.9	5.7	6.4JH	6.4	6.3	6.8	6.8	6.6	6.0	5.1	4.0	3.3F	2.7	2.4	2.3	2.2	2.1		
28	2.5	2.8F	2.9F	3.2F	3.2	3.2	3.1	5.0	5.7	5.7	6.9	6.8	6.2	6.8	6.4H	6.4	(5.3)H	4.0	3.0	2.6FS	2.2	1.9JS	(1.9)S	2.0F		
29	2.5	3.1	3.1F	3.3	3.2	2.5	2.4	4.8	6.0JS	5.6	6.8	6.6	5.8JH	6.2	6.6	5.7	5.4	(3.5)S	2.7	2.4	2.2	2.0	1.8	1.7JS		
30	1.6	1.7	2.4	2.6F	2.8F	2.8F	2.9F	5.0	5.8	5.3	4.9	6.5	(5.6)JH	6.0	5.8	5.7	5.4	4.8	3.2	(2.7)PS	2.3	2.1	1.9JS	1.8		
31																										
Median	2.6	2.8	2.9	3.0	2.8	2.5	2.7	4.8	5.4	5.6	6.2	6.4	6.6	6.6	6.4	6.0	5.6	4.7	3.6	2.9	2.6	2.3	2.2	2.3		
Count	26	25	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	27	28	28	28		

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 52

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

Form adopted June 1946

h' F1 (Characteristic), Km (Unit), November (Month), 1953

Observed at Washington, D. C.

Lat. 38.7°N, Long. 77.1°W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C, E.J.W.

Calculated by: Mc C, E.J.W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									200	A	A	190	180H	210	(210)A	210	Q							
2									210	200	200	190	180	230	220	210	Q							
3									Q	200	200	190H	220	200	230	220	Q							
4									210K	210K	210K	200K	210K	200HK	190HK	QK	QK							
5									Q	210	210	220	220	230	240	230	230							
6									230	(210)A	[200]A	200H	210	220	220	220	220							
7									220	200H	200	190H	[200]A	200H	210	230	Q							
8									220	200	180	180H	220	220	230	210	Q							
9									Q	210	200	200	190	200	220	220	210							
10									190H	210	220	210	210	200	200	230	220							
11									210	210	210	190	200	210	220	230	Q							
12									A	210	200	200	220	230	210	210	230							
13									250	220	210	210	210	210	200	220	210							
14									Q	230	210	210	200	210	220	230	Q							
15									Q	250	230	230	220	220	230	230	Q							
16									Q	220	210	200	200	200	220	230	220							
17									200	200	230	210	210	200	210	230	Q							
18									220	210	200H	220	200H	210	210H	(230)A	A							
19									Q	A	220	(210)A	210	(210)A	[200]A	200	Q							
20									Q	200	180	220	210	200	230	220	Q							
21									Q	220	230	A	A	240	(210)H	220	Q							
22									Q	230	210	180H	200H	220	230	230	A							
23									Q	Q	200	190	230	230	220	230	Q							
24									Q	210	190	190	190H	200	200	220	Q							
25									Q	210	190	190H	210	210	210	Q	Q							
26									210	[210]A	210	180H	200	200	190H	210	230							
27									Q	200	200	180	230	200H	220	200	Q							
28									Q	210	200	200	220	200	200	210	Q							
29									Q	210	200	210	210	220	220	Q	Q							
30									Q	A	(220)A	210	[200]A	190	230	Q	Q							
31																								
Median									210	210	200	200	210	210	220	220	220							
Count									12	26	29	29	29	30	30	26	8							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 53

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

Form adopted June 1946

fo F1 (Characteristic), Mc (Unit), November (Month), 1953

National Bureau of Standards (Institution)

Observed at Washington, D. C.

Scaled by: Mc C., E.J.W., J.W.P.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

Calculated by: Mc C., E.J.W., J.W.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	A	(3.9)L	4.0	(3.9)H	3.9	(3.8)S	L	Q							
2									L	L	3.6	[3.8]L	4.1	4.1	L	L	Q							
3									Q	3.5	3.8	[3.9]L	(4.0)L	(4.0)L	L	L	Q							
4									L	L	L	L	(4.0)L	L	L	Q	Q							
5									QK	3.5K	3.7K	3.7K	3.9K	3.9K	3.7K	(3.4)LK	LK							
6									L	L	L	(4.0)L	4.0	(3.9)L	3.8	L	L							
7									L	L	L	L	L	(3.9)H	L	L	Q							
8									L	L	L	L	4.1	L	L	L	Q							
9									Q	L	L	L	3.9	L	L	L	L							
10									L	L	L	L	L	4.0	L	L	L							
11									L	L	L	L	3.9	L	L	L	Q							
12									L	L	L	L	L	L	L	2.7	L							
13									L	L	3.8	3.9	3.8	[3.9]L	3.4	[2.8]L	2.2							
14									Q	L	(3.7)L	(3.8)L	3.9	L	L	L	Q							
15									Q	L	L	L	3.9	(3.8)S	L	L	Q							
16									Q	L	L	3.8	3.8	L	L	L	L							
17									L	L	L	(3.8)L	L	L	L	L	Q							
18									L	L	L	L	3.8H	L	L	L	A							
19									Q	L	3.7	3.8	3.9	(3.9)L	[3.6]L	3.2	Q							
20									Q	L	L	L	L	L	L	L	Q							
21									Q	L	L	A	L	L	L	L	Q							
22									Q	L	L	(3.7)H	L	L	L	L	A							
23									Q	Q	3.7	3.9	L	L	L	L	Q							
24									Q	L	3.3	L	L	3.8	L	L	Q							
25									Q	L	L	L	L	L	L	Q	Q							
26									L	L	L	L	L	3.6	L	L	L							
27									Q	3.0	L	3.6	L	L	L	3.0	Q							
28									Q	L	L	L	L	L	L	L	Q							
29									Q	L	L	L	L	L	L	Q	Q							
30									Q	A	L	3.9	[3.8]L	3.6	L	Q	Q							
31																								
Median									—	—	3.7	3.8	3.9	3.9	3.7	3.0	--							
Count										3	9	14	16	13	5	5	1							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 54

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

IONOSPHERIC DATA

h'E (Characteristic), Km (Unit), November (Month), 1953

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C., E.J.W., J.W.P.

Calculated by: Mc C., E.J.W., J.W.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	A	A	100	(100)A	[100]A	(100)A	(100)A	A							
2									100H	100	(100)A	100	[100]A	100	100	100	120							
3									110	100	100	100	100	100	100	100	A							
4									A	A	A	A	A	A	100	100	(120)A							
5									AK	AK	AK	AK	AK	(100)AK	100K	AK	AK							
6									120H	120	A	A	A	A	110	110	(120)A							
7									A	A	100	(100)A	A	A	A	A	A							
8									120H	A	A	A	A	100	110H	120	A							
9									A	A	(110)A	110	110	100	120	110H	A							
10									120H	110	110	100	100H	100	100H	(120)H	A							
11									A	(110)A	100	100	110	100	100H	110	120							
12									A	A	100	110	[100]A	100	110	120	A							
13									110	110	110	110	100	110	100	(120)A	110							
14									A	110	110	110	100	110	110	120	120H							
15									120	110	110	100	110	120	120	120	120							
16									A	(110)A	120	110	110	100	100	[100]A	100							
17									(120)S	(120)A	A	A	A	A	100	A	S							
18									110H	110H	A	(110)H	110H	A	A	A	A							
19									A	100	100	100	100	100	100	100	A							
20									(130)S	[120]A	110H	110	120	(120)S	(120)A	A	S							
21									(110)S	110H	(120)A	(110)A	(110)A	(110)A	120	(120)S	(120)S							
22									(120)S	110H	110	110	120	110	110	(120)A	A							
23									A	120	100	100	100	110	100	110	A							
24									110H	110	100	100	100	100	100	100	S							
25									A	A	(110)A	(100)A	(120)A	(120)A	[120]A	120	(130)S							
26									A	A	A	110	100	110H	100H	(120)S	A							
27									(130)S	110	[100]A	100	100	100	110	100	A							
28									(110)S	110	110	100	100	100	(120)A	(120)A	(120)S							
29									A	110	[120]A	120	110	110	110	110	A							
30									A	110	110	100H	[100]A	(110)A	100H	110H	A							
31																								
Median									120	110	110	100	100	100	100	110	120							
Count									15	21	22	25	24	25	28	25	11							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 55

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foE (Characteristic) , Mc (Unit) November (Month), 1953

Observed at Washington, D. C.

Lat 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C., E. J. W., J. W. P.

Calculated by: Mc C., E. J. W., J. W. P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	A	A	A	3.0	[2.9]A	2.8	2.6	A							
2									2.4^H	2.7	2.9	3.0	[3.0]A	3.0	2.9	2.5	2.1							
3									2.1	2.6	2.8	2.9	3.0	3.0	2.8	2.5	A							
4									A	A	A	A	A	A	$(2.8)^P$	$(2.6)^S$	2.3^H							
5									A^K	A^K	A^K	A^K	$(2.9)^A_K$	2.8^K	2.7^K	A^K	A^K							
6									$(1.9)^A$	$(2.1)^A$	A	A	A	$(2.8)^A$	2.7	2.4	$(2.0)^A$							
7									$(2.1)^A$	$[2.4]^A$	2.7	2.8	A	A	A	A	A							
8									2.2^H	$(2.5)^A$	$(2.6)^A$	A	A	2.8	2.7^H	$(2.4)^P$	A							
9									A	A	$(2.7)^A$	$(2.8)^P$	2.9	2.9	2.8	2.5^H	A							
10									$(2.2)^H$	2.5	2.8	2.9	3.0^H	2.9	2.7^H	2.5^F	A							
11									A	2.5	2.7	2.9	3.0	[2.8]A	2.7^H	2.4^H	A							
12									A	A	A	A	A	A	A	A	A							
13									2.0	A	A	2.9^H	2.9	A	A	$(2.4)^P$	1.9							
14									A	$(2.4)^P$	2.6	2.7	2.7	2.6	2.5	2.3	$(1.9)^H$							
15									2.0	$(2.5)^P$	$(2.6)^P$	2.6	2.7	2.7	A	2.3	1.9							
16									A	2.4	[2.6]A	$(2.7)^P$	2.7	$(2.7)^A$	2.5	[2.2]A	1.9							
17									2.0	2.4^H	[2.6]A	$(2.8)^A$	A	A	2.6	A	S							
18									1.9^H	2.2^H	2.6^H	$(2.7)^P$	$(2.8)^B$	A	A	A	A							
19									A	A	A	A	A	A	A	2.3^F	A							
20									$(2.0)^P$	[2.3]A	2.6^H	2.7	2.9	$(2.8)^P$	$(2.7)^S$	A	S							
21									S	2.3^H	2.6	2.5	$(2.6)^A$	2.8^H	2.6	2.3	1.7							
22									2.2	$(2.4)^H$	2.6^H	2.7	2.8	2.7	2.5	2.3^H	A							
23									A	M	2.6	2.7	2.8	2.7	2.5	2.2	A							
24									2.0^H	2.5	2.7	2.8	2.8	2.8	2.6	2.4	1.9							
25									A	A	2.6	2.6	$(2.8)^P$	2.8	[2.5]A	2.2^H	1.8							
26									A	A	A	2.6	2.8	2.7^H	$(2.5)^H$	$(2.4)^P$	A							
27									$(1.9)^P$	$(2.4)^S$	A	A	3.0	2.8	2.5	A	A							
28									2.0^H	2.4	2.7	2.7	2.8	2.7	2.6	2.4	1.9							
29									A	2.4	[2.6]A	2.7	[2.7]A	2.7	2.6	2.3	A							
30									A	2.4	2.6	2.7^H	A	A	2.6^H	2.4^H	A							
31																								
Median									2.0	2.4	2.6	2.7	2.8	2.8	2.6	2.4	1.9							
Count									15	20	21	22	22	22	24	23	11							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 56

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

Es (Characteristic), Mc, Km (Unit), November (Month), 1953

National Bureau of Standards (Institution)

Observed at Washington, D. C.

Lat. 38.7°N, Long. 77.1°W

75° W Mean Time

Scaled by: McC., E. J. W.

Calculated by: McC., E. J. W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.6/110	3.4Y/100 H	4.9/100	3.9/100	3.5/100	3.6/100 H	33/120	3.7/120 H	6.6/100	5.2/110	50/110	46/100	35/100	50/100	5.0/100	5.8/100 H	40/100	5.1/100	58/100	3.1/100	2.1/100	20/110	E	E
2	3.5/100	3.3/100	3.2/100	4.3/100	E	3.8Y/100	2.3Y/140	E	G	3.6Y/100	3.6Y/100	3.7Y/100	39/100	G	G	G	2.4/140	2.2/120	17/110	E	E	E	3.1/100	3.6/100
3	3.3/100	38/100	3.0Y/100	3.8/100	7.4Y/100 H	2.5/100	2.7/100	9.0Y/100	G	G	G	3.7Y/100	G	G	G	G	4.0Y/100	33/100	3.0/100	2.6Y/100	E	E	2.5/100	E
4	E	2.5/100	3.6Y/100 H	2.7/100	4.2/100	4.0/100	E	E	2.3/110	6.2Y/100	6.8Y/100	3.2/100	5.2/100	4.1/100	G	G	31/100	3.8/100	3.5/100	34Y/100	3.0/110	26Y/110	5.8/100	37/100
5	2.5/100	4.4/100	E	E	E	2.5/100	E	11.0Y/110	3.8Y/100	2.7F/120	3.2/110	3.1Y/100	2.7/100	26/100	G	4.4/100	2.1/120	24/110	22/120	E	2.3/100	3.1Y/130	4.2Y/120 H	B
6	2.9/140	E	E	E	E	E	7.4Y/130	E	30/120	4.4/120	7.1/110	3.8/110	3.7/100	38Y/100	G	G	2.0/120	E	83Y/110	4.2Y/110	4.6/100	22/110	18Y/120	E
7	E	3.7/110	47/110	3.3/110	3.1/110	E	E	E	30Y/110	4.9/100	G	3.6Y/100	5.0/100	54/100	41/100	2.5/100	1.9/100 H	31Y/100	2.3Y/100	2.2Y/100	2.2Y/100	3.3Y/110	43/110	4.5/100
8	4.3/100	4.5/100	4.1/100	3.8/100	3.9Y/100	2.3Y/100 F	E	E	G	3.8/100	4.3Y/100	4.8/100	6.9Y/100	2.9/120	2.8/120	2.5/120	2.1/120	E	E	E	E	E	E	3.2/110
9	2.3/110	2.5/110	2.4/110	E	2.4Y/100	4.3Y/140	2.2Y/100	E	3.3/120	3.8/110	30Y/110	G	G	G	G	G	2.5/110	E	E	E	E	E	24/110	E
10	30/100	E	E	E	4.3Y/120	39Y/100	E	E	36Y/110	G	G	G	G	G	G	24/100	3.5/100	1.8/100	24/100	E	E	E	E	E
11	2.4/100	E	E	E	E	E	E	10.5Y/120	3.0Y/110	3.3/110	3.6Y/100	G	G	3.1/100	G	G	3.1Y/130	E	E	E	E	27/110	5.2Y/110	27/110 H
12	E	E	24/110	E	2.5/100	29/100	2.5/100	E	3.3/110	4.2/120	39/110	38/110	3.7Y/110	3.8/120	36/130	2.6/130	2.0/120	36/120	E	3.5/120	E	4.5Y/110	3.3/110	3.0/110
13	2.4/110	E	E	2.4/110	2.2/110	3.9/100	24/100	3.0/120	G	3.2/120	2.8/120	G	G	3.8/110	3.9Y/100	2.1/100	2.1/130	E	E	2.7/110	3.8Y/110	3.2/110	4.3Y/110	4.3/110
14	2.3/120 H	2.3/100	E	E	22/110	2.4/100	E	2.1/110	28/120	G	G	G	32/130	32/120	G	G	G	E	E	7.4/120	4.5/110	3.6/110	2.7Y/110	3.0/110
15	4.4/100	3.9/100	3.1/100	3.0/110 H	37/110	23/110	2.4/110	E	G	G	G	G	10.0/100	G	2.9/120	G	G	E	E	E	3.0/110	45/110 H	27/110	2.8/110
16	3.7/110	E	4.3Y/130	E	E	7.4Y/120 H	E	E	21/130	25/110	2.5/120	G	G	G	G	3.1Y/100	G	24/100	E	E	E	2.8Y/110	E	2.3/120
17	E	E	E	E	E	E	E	2.1/150	G	2.6Y/110 H	3.0/110	3.0/110	31/100	2.8Y/100	G	2.4/120	G	E	3.0Y/110	3.1Y/110	2.9/110	2.3/120	3.0/110	3.0/110
18	2.5Y/110	2.3/110	2.4Y/100	E	E	2.1Y/100 H	2.3Y/110	2.3Y/110 H	G	G	2.4/110	G	G	3.6/100 H	26/100	2.8Y/100 H	7.0/100 H	12.5/110	3.5Y/110	4.7/110	7.0/110	37Y/110	32/110	29Y/120
19	35/110	E	E	2.6Y/110	45/120	2.7/120	3.6/110	3.1Y/110	32/110	7.0/100	64/110	38/100	31/110	34/130	3.8/120	2.8/130	2.6/120	4.3/100	42/100	4.0/110	41/110	2.8/110	3.1/110	3.0/110
20	39/100	2.5/100	E	E	E	2.7/100	30/100	E	G	3.0Y/110 H	G	G	G	21/100	2.3/100	24/100	G	E	E	E	E	E	1.7/110	E
21	1.7/110	E	1.4/100	2.4Y/100	E	68Y/120	E	E	G	G	2.3/100	4.9/120	45/120	2.2/100	G	G	23/120	2.3/100	4.1Y/100	2.2/110 H	E	E	E	13Y/100
22	E	E	1.8/100	E	E	2.3/110	22/110	2.9Y/120	G	G	29/140	G	G	30/140	3.0/140	2.7/140	3.7/100 H	23/100 H	E	E	E	E	E	E
23	E	E	2.1/100	2.2/100	E	E	3.5Y/120	2.4/120	33/110	M	3.6Y/110	G	G	6.8/100	G	G	39Y/100	3.3/100	23/110	E	E	E	E	E
24	E	E	E	E	E	E	E	E	G	2.6/120	G	G	G	3.5/100	G	2.6/100	2.4/100	E	E	E	E	E	E	E
25	E	E	E	E	E	E	E	E	22/110 H	24/110	2.4/110	24/100	2.7Y/100	30Y/100	3.0/100	G	G	2.1Y/100 H	E	E	E	E	3.0Y/100	E
26	17Y/120	E	E	E	E	E	E	E	2.2Y/100 H	2.7/120	2.6/110	G	G	G	G	G	6.6Y/100	3.0Y/100 H	3.2Y/100	35Y/90	E	E	E	E
27	2.4/110	E	E	E	E	E	E	3.7Y/110	G	G	3.2/110	30Y/100	G	G	7.0Y/100	2.5/130	2.1/100	21/100	2.3/100	25Y/100	E	E	E	E
28	E	E	31/100	2.3Y/100	E	E	E	E	20/110	G	G	G	G	G	31/100	32/100	G	E	E	E	3.6Y/110	E	E	E
29	2.7/110	E	E	25Y/110	3.0F/110	7.4Y/110 H	23/110	E	3.2Y/100 H	G	3.8/110	3.6/100	32/120	G	G	G	20/110	3.2/110	24/110	24/110	E	E	E	25/110
30	E	E	E	E	E	2.9/100	2.9/120	3.6Y/110	36Y/130	44/120 H	4.1/120	3.8/120	5.0/110	3.5Y/110	76Y/110	3.7Y/120	2.0/110	2.6Y/110	3.2/110	23/110	2.8/110	30/100	E	E
31																								
Median	2.4	* *	* *	* *	* *	2.4	* *	* *	2.2	2.7	3.0	2.7	2.7	3.0	* *	2.4	2.1	2.2	2.2	2.2	* *	* *	2.1	1.3
Count	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	29

* * MEDIAN fEs LESS THAN MEDIAN foE, OR LESS THAN LOWER FREQUENCY LIMIT OF RECORDER.

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 57

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

(M1500)F2 (Characteristic), ______ (Unit), November (Month), 1953

National Bureau of Standards (Institution)

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

Scaled by: Mc C., E. J. W.

Calculated by: Mc C., E. J. W.

Form adopted June 1946

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	$(20)^{F}$	A	2	22^{F}	21^{F}	$(2.1)^{F}_{A}$	24	2.5	2.3	25^{H}	2.3^{H}	23	23	2.3	24	23	24	23	21^{F}	21^{F}	22	21^{F}	22^{F}
2	$(20)^{F}$	$(2.1)^{F}$	$(22)^{F}$	$(21)^{J}_{F}$	2.1^{F}	21	23	24	2.5	2.4	25	2.3	2.3	23^{H}	25	24	2.4	24	2.2	2.2	2.2	2.1	2.0	2.1^{F}
3	2	$(23)^{S}$	$(22)^{J}_{F}$	$(21)^{F}$	2.1	22	22	25	2.5	2.5	24	2.3	2.4	2.3	2.3^{H}	23^{H}	2.4	26	23	21	2.1	21	2.1	20
4	[illegible]	$(21)^{J}_{F}$	22	2.2	2.1	23	2.4	2.6	2.6	2.5	2.4	$(2.4)^{J}_{S}$	2.4	22	2.4	24	24	24	2.4	20	2.1	20	A	$(1.9)^{A}$
5	[illegible]	22	[illegible]	2.1	23^{K}	21^{K}	S^{K}	$(23)^{H}_{K}$	2.2^{K}	21^{K}	1.9^{K}	1.8^{K}	20^{K}	1.9^{K}	22^{K}	23^{F}_{K}	$^{K}(2.4)^{J}_{F}$	2.3^{K}	2.1^{K}	$^{K}2.2^{F}_{S}$	$^{K}(2.0)^{P}_{S}$	S^{K}	$^{K}(1.9)^{J}_{S}$	$^{K}(2.0)^{J}_{B}$
6	[illegible]	[illegible]	$^{K}(2.2)^{F}_{S}$	$^{K}(22)^{P}_{F}$	$^{K}(21)^{P}_{F}$	F^{K}	$(22)^{P}_{F}$	24^{F}	2.5	2.4^{S}	23	22	2.2	2.4	24	2.4	24	2.4	$(2.2)^{P}_{A}$	$(2.2)^{P}_{S}$	2.2^{F}	22^{F}	$(2.0)^{P}_{F}$	$(2.1)^{P}_{F}$
7	$(2.1)^{J}_{F}$	F	$(21)^{P}_{F}$	$(2.3)^{J}_{F}$	$(21)^{J}_{F}$	$(2.2)^{P}_{F}$	$(2.1)^{P}_{F}$	24	2.7	2.3	24	2.2	23	2.5	2.3	24	2.4	23	22	24	22	2.2	$(2.1)^{A}$	A
8	A	[illegible]	A	23^{F}	22^{F}	2.3^{F}	2.2	25	25	2.4	2.3	22	2.3	2.3	2.3	25	2.4	25	24	22	2.2	2.2	2.1	2.1
9	2	[illegible]	20	2	2	[illegible]	24	[illegible]	[illegible]	24	25	25	2.3	2.5	24	24	2.5	2.5	2.1	21	23	2.2	20	20
10	[illegible]	[illegible]	22	21	[illegible]	2.2	23	[illegible]	22	2.4	$(2.5)^{S}$	$(2.1)^{J}_{H}$	2.4	2.4	24	2.3	2.5	2.4	2.3	23	22	2.2	2.0	2.1
11	21	2.0	21	29	21	$(22)^{J}_{S}$	2.4	[illegible]	26	2.4	2.3	$(26)^{S}$	2.4	2.4	25	24	2.4	2.5	23	2.3	2.1	2.0	1.9	20
12	20	21	23	23	24^{F}	2.3^{F}	$(24)^{J}_{F}$	[illegible]	26	2.5	2.6	2.4	2.3	2.4	2.4	23	2.2	2.3	2.2	2.5	$(23)^{J}_{F}$	$(20)^{F}$	20^{F}	1.9
13	[illegible]	22	$(20)^{F}$	$(22)^{S}_{F}$	$(23)^{F}$	24	[illegible]	[illegible]	[illegible]	2.3	22	23	2.0	23	1.9	2.0	2.3	2.3	23	$(2.3)^{S}$	$(2.3)^{A}$	A	A	$(1.9)^{S}_{P}$
14	$(1.8)^{J}_{S}$	$(2.0)^{J}_{S}$	$(20)^{J}_{S}$	$(21)^{J}_{S}$	$(22)^{J}_{S}$	23	[illegible]	22	2.2	22	2.4	2.4	2.3	2.3	2.4	2.3	2.3	$(2.4)^{S}$	$(2.2)^{S}$	$(2.4)^{J}_{S}$	$(2.3)^{F}_{S}$	$(2.3)^{F}$	$(1.9)^{S}_{K}$	F^{K}
15	A^{K}	A^{K}	$(2.0)^{S}_{K}$	$^{K}(22)^{J}_{S}$	A^{K}	$(2.2)^{J}_{S}$	E^{K}	23	2.5	2.3	2.3	2.3	24	2.4	2.4	2.4	26	2.1	$(2.1)^{J}_{S}$	2.4	2.0^{F}	$(23)^{J}_{F}$	$(20)^{F}$	$(2.1)^{J}_{F}$
16	E	E	E	E	E	E	E	23	2.3	2.3	2.4	2.4^{H}	2.4	23	2.3	2.5	2.5	2.5	2.3^{S}_{F}	$(2.3)^{J}_{S}$	2.3	2.0^{F}	1.9^{S}_{F}	$(20)^{F}_{H}$
17	$(2.2)^{F}$	$(22)^{F}$	$(21)^{F}$	$(21)^{F}$	$(21)^{F}_{S}$	$(2.2)^{F}_{S}$	2.3^{F}_{S}	2.4	25	2.4	2.4	25	$(2.3)^{J}_{S}$	2.4	2.3	24	24^{S}	2.5	$(25)^{J}_{S}$	2.2	2.4	21	2.1	2.0^{F}_{S}
18	2.1^{F}_{S}	$(21)^{P}_{F}$	2.2^{F}	2.2^{F}_{S}	23	2.3^{F}_{S}	2.3^{F}	24	2.4	24	2.5	2.4	2.4	2.5	2.4	2.5	25	$(24)^{P}_{A}$	2.5^{F}	$(2.1)^{P}_{A}$	$(2.2)^{A}$	$(2.1)^{P}_{F}$	$(2.0)^{P}_{A}$	$(2.0)^{F}_{A}$
19	A	$(22)^{P}_{F}$	$(21)^{P}_{F}$	F	2.3^{F}_{S}	[illegible]	2.1^{F}	[illegible]	2.3	2.4	2.3	22	2.4	2.4	2.2	24^{S}	24	$(23)^{F}_{S}$	$(2.2)^{F}_{S}$	$(2.2)^{F}_{S}$	23	2.1	2.0^{F}	21^{F}
20	$(20)^{A}$	$(2[illegible])^{F}$	$(22)^{F}$	22^{F}	[illegible]	A	AS	[illegible]	[illegible]	24	24	2.3	2.3	2.3	23	2.4	23	2.3	2.3	2.2^{F}_{S}	22^{F}_{S}	$(2.1)^{P}_{F}$	$(2.2)^{P}_{F}$	F
21	$(21)^{P}_{F}$	21^{F}_{S}	F	$(2.3)^{P}_{F}$	21	22^{F}	$(2.2)^{F}_{F}$	[illegible]	26	26	26	24	2.5	2.5	2.5	25	25	2.6	2.1	22	$^{K}(21)^{P}_{S}$	$^{K}(2.1)^{P}_{S}$	F^{K}	E^{K}
22	$(20)^{S}_{K}$	F^{K}	F^{K}	F^{K}	F^{K}	24^{F}_{S}	2.3^{F}	[illegible]	26	25	27	25	23	23	2.4	2.5	24	25	22	23	23^{F}	2.2^{F}	$(22)^{P}_{F}$	F
23	20^{F}	21^{F}_{S}	$(23)^{F}_{P}$	$(23)^{F}_{P}$	F	S	A	[illegible]	2.4	25	2.4	24	24	24	2.4	23	2.3	$(23)^{J}_{S}$	2.2	$(2.4)^{J}_{S}$	$(24)^{S}$	2.0^{F}	23^{F}	(20)
24	$(21)^{F}$	$(20)^{F}$	$(21)^{F}$	2.1	23	25	2.5	23	25	2.5	26	2.4	2.6	2.4	2.4	26	25	25	2.2^{F}_{S}	$(2.2)^{F}_{S}$	$(22)^{S}$	2.2^{F}_{S}	21	22
25	$(2.1)^{F}_{S}$	21^{F}_{S}	21	22	23	24	$(25)^{F}_{S}$	2.3	26	2.3	2.4	25	2.6	2.5	2.5	27	2.5	$(24)^{J}_{S}$	2.1	2.2	23	21	22^{F}	2.1^{F}_{S}
26	$(21)^{P}_{F}$	F	F	F	FS	2.3^{S}	24	23	$(26)^{P}_{S}$	2.6	2.5	2.5	22^{H}	2.5	25	25	25	2.7^{S}	$(2.1)^{P}_{S}$	$(2.3)^{J}_{S}$	2.3^{F}	$(22)^{P}_{S}$	$(2.0)^{P}_{F}$	$(2.0)^{F}$
27	2.0^{F}	$(21)^{P}_{F}$	2.1^{F}	21	2.2	2.4	23	2.4	2.6	$(2.4)^{J}_{H}$	26	26	2.4	2.5	2.4^{Z}	25^{H}	24	25	2.3^{F}	2.4^{F}	2.3	2.1	1.9	2.0
28	20	21^{F}	2.2^{F}	22^{F}_{S}	23	$(2.1)^{S}$	2.3^{F}_{S}	2.4	2.4	2.6	2.3	2.5	2.3^{H}	2.4	2.4	2.5	2.6	2.5	2.1	2.2	2.1	21	$(1.9)^{J}_{S}$	2.1
29	2.0	2.1	2.1^{F}	22	2.4	24	21	$(2.3)^{J}_{S}$	2.4	2.6	2.1	2.4	2.6	2.4	22^{H}	2.6	2.4	$(2.5)^{J}_{H}$	25	2.3	2.1	2.2	$(21)^{J}_{S}$	2.1
30	$(2.1)^{J}_{S}$	$(21)^{S}$	2.1	2.2^{F}	2.3	2.3	$(22)^{S}$	2.4^{F}_{S}	2.7	2.6	2.7	2.4	2.7	2.5	25	2.3	2.6	2.3	2.8	2.2	2.3	2.2	2.2	$(2.1)^{S}$
31																								
Median	20	(21)	2.1	22	2.2	23	23	24	25	24	24	24	2.4	24	2.4	2.4	24	2.4	2.2	2.2	2.2	2.1	2.0	2.0
Count	26	24	24	26	25	26	24	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	27	25

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 58

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

IONOSPHERIC DATA

(M3000)F2, ____ (Characteristic) (Unit) November, 1953 (Month)

Observed at Washington, D. C.

Lat. 38.7°N, Long 77.1°W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C., E. J. W.

Calculated by: Mc C., E. J. W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.0	(3.0)F	A	3.1	3.2 F	3.1 F	(3.1)FA	3.5	3.6	3.4	3.5 H	3.3 H	3.3	3.3	3.4	3.5	3.4	3.5	3.3	3.1 F	3.1 F	3.2	3.1 F	3.2 F
2	(3.0)F	(3.1)F	(3.2)F	(3.1)SF	3.1 F	3.1	3.3	3.5	3.6	3.5	3.5	3.3	3.4	3.3 H	3.6	3.5	3.5	3.5	3.2	3.2	3.2	3.1	3.0	3.1 F
3	3.1	(3.3)S	(3.2)SF	(3.1)F	3.1	3.2	3.2	3.6	3.6	3.6	3.5	3.3	3.4	3.4	3.3 H	3.4 H	3.5	3.6	3.3	3.1	3.1	3.1	3.1	3.0
4	3.1	(3.1)JF	3.2	3.2	3.1	3.4	3.4	3.6	3.6	3.6	3.5	(3.5)JS	3.4	3.2	3.5	3.4	3.5	3.5	3.5	3.0	3.1	3.0	A	(2.9)A
5	3.1	3.2	3.1	3.1	3.3 K	3.2 K	S K	(3.4)HK	3.2 K	3.1 K	2.8 K	2.7 K	3.0 K	2.9 K	3.3 K	3.4 FK	K(3.4)JF	3.4 K	3.1 K	K3.2 FS	K(3.0)PS	S K	K(2.9)JS	K(3.0)JB
6	K(2.9)JA	K(2.9)JS	K(3.3)PS	K(3.2)PF	K(3.1)PF	F K	(3.2)PF	3.5 F	3.6	3.5 S	3.3	3.2	3.2	3.5	3.5	3.5	3.5	3.5	(3.3)PA	(3.2)PS	3.3 F	3.2 F	(3.0)PF	(3.1)PF
7	(3.1)PF	F	(3.2)PF	(3.3)JF	(3.2)JF	(3.2)PF	(3.1)PF	3.5	3.8	3.4	3.5	3.2	3.4	3.6	3.3	3.5	3.5	3.4	3.3	3.4	3.3	3.2	(3.1)A	A
8	A	A	A	3.3 F	3.3 F	3.2 F	3.3	3.6	3.6	3.5	3.3	3.3	3.4	3.3	3.4	3.6	3.5	3.5	3.5	3.2	3.2	3.2	3.1	3.1
9	3.1	3.1	3.0	3.1	3.1	3.3	3.4	3.5	3.6	3.5	3.5	3.5	3.4	3.5	3.5	3.5	3.5	3.6	3.1	3.2	3.3	3.2	3.0	3.0
10	3.0	3.2	3.2	3.1	3.1	3.2	3.3	3.0	3.3	3.5	(3.6)S	(3.1)JH	3.4	3.5	3.5	3.4	3.6	3.5	3.3	3.4	3.2	3.2	3.0	3.1
11	3.1	3.0	3.1	3.1	3.1	(3.2)JS	3.4	3.6	3.7	3.5	3.4	(3.7)S	3.5	3.4	3.5	3.4	3.5	3.6	3.3	3.4	3.1	3.0	3.8	3.0
12	3.0	3.1	3.3	3.4	3.5 F	3.4 F	(3.5)JF	3.5	3.7	3.6	3.6	3.5	3.3	3.4	3.5	3.3	3.2	3.4	3.2	3.5	(3.3)JF	(3.0)F	3.0 P	2.8
13	2.8	3.2	(2.9)F	(3.2)SF	(3.3)F	3.4	S	3.3	3.5	3.4	3.3	3.3	3.0	3.4	2.9	3.0	3.3	3.3	3.4	(3.3)S	(3.3)A	A	A	(2.9)SP
14	(2.8)JS	(3.0)JS	(3.0)JS	(3.1)JS	(3.3)JS	3.4	2.9	3.3	3.3	3.3	3.4	3.4	3.4	3.3	3.4	3.4	3.3	(3.4)S	(3.2)S	(3.4)JS	(3.4)FS	(3.3)F	(2.8)SK	F K
15	A K	A K	(2.9)S	K(3.2)JS	A K	K(3.2)JS	E K	3.4	3.5	3.4	3.3	3.3	3.5	3.5	3.5	3.5	3.6	3.1	(3.1)JS	3.5	3.0 F	(3.3)JF	(3.0)F	(3.1)JF
16	E	E	E	E	E	E	E	3.3	3.4	3.4	3.5	3.5 H	3.4	3.4	3.3	3.6	3.5	3.5	3.3 SF	(3.3)JS	3.3	3.0 F	2.9 SF	(3.0)FH
17	(3.2)F	(3.2)F	(3.1)F	(3.1)F	(3.1)FS	(3.2)FS	3.3 FS	3.4	3.6	3.5	3.5	3.6	(3.4)JS	3.5	3.4	3.5	3.5 S	3.6	(3.5)JS	3.3	3.5	3.1	3.1	3.0 FS
18	3.1 FS	(3.1)PF	3.2 F	3.3 FS	3.3	3.3 FS	3.4 F	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.6	(3.5)PA	3.6 F	(3.1)PA	(3.2)A	(3.2)PF	(3.0)PA	(3.0)PA
19	A	(3.2)PF	(3.1)PF	F	3.4 FS	3.5 V	3.1 F	3.3	3.4	3.5	3.3	3.2	3.5	3.5	3.3	3.5 S	3.5	(3.4)FS	(3.2)FS	(3.3)FS	3.3	3.1	3.0 F	3.2 F
20	(3.0)AF	(3.0)FS	(3.2)FS	3.3 FS	3.6 F	A	A S	3.3 S	3.6	3.5	3.5	3.3	3.4	3.4	3.4	3.5	3.4	3.3	3.4	3.3 FS	3.2 FS	(3.1)PF	(3.3)PF	F
21	(3.2)PF	3.2 FS	F	(3.4)PF	3.2	3.2 F	(3.2)PF	(3.4)FS	3.7	3.7	3.7	3.5	3.6	3.6	3.6	3.6	3.5	3.6	3.1	3.4	K(3.1)PS	K(3.1)PS	F K	E K
22	(3.0)SK	F K	F K	F K	F K	3.4 FS	3.3 F	3.3	3.7	3.6	3.8	3.6	3.4	3.4	3.4	3.5	3.5	3.6	3.2	3.3	3.4 F	3.2 F	(3.2)PF	F
23	3.0 F	3.2 FS	(3.4)PF	(3.2)PP	F	S	A	3.3	3.5	3.6	3.5	3.4	3.4	3.5	3.5	3.3	3.3	(3.3)JS	3.2	(3.5)JS	(3.4)S	3.0 F	3.3 F	(3.0)F
24	(3.1)F	(3.0)F	(3.1)F	3.1	3.3	3.5	3.5	3.3	3.6	3.6	3.7	3.5	3.7	3.5	3.5	3.7	3.6	3.6	3.2 FS	(3.2)FS	(3.2)S	3.2 FS	3.1	3.2
25	(3.1)FS	3.1 FS	3.1	3.3	3.4	3.4	(3.6)FS	3.3	3.7	3.4	3.5	3.6	3.7	3.6	3.6	3.8	3.5	(3.4)JS	3.2	3.3	3.3	3.1	3.2 F	3.2 FS
26	(3.1)PF	F	F	F	F S	3.4 S	3.5	3.4	(3.7)PS	3.7	3.6	3.6	3.2 H	3.6	3.6	3.5	3.6	3.8 S	(3.1)PS	(3.3)JS	3.4 F	(3.3)PS	(3.0)PF	(3.0)F
27	3.0 F	(3.1)PF	3.2 F	3.1	3.2	3.5	3.4	3.4	3.7	(3.5)JH	3.7	3.6	3.4	3.6	3.4 Z	3.6 H	3.5	3.5	3.3 F	3.4 F	3.3	3.1	2.9	3.0
28	3.0	3.1 F	3.3 F	3.2 FS	3.3	(3.1)S	3.3 FS	3.5	3.5	3.7	3.4	3.6	3.4 H	3.4	3.5	3.6	3.6	3.6	3.1	3.2	3.1	3.1	(2.9)JS	3.1
29	3.0	3.1	3.1 F	3.2	3.4	3.4	3.1	(3.3)JS	3.4	3.7	3.1	3.4	3.7	3.5	3.2 H	3.7	3.5	(3.5)JH	3.6	3.3	3.1	3.2	(3.1)JS	3.1
30	(3.1)JS	(3.1)S	3.1	3.3 F	3.3	3.4	(3.2)S	3.4 FS	3.7	3.7	3.8	3.5	3.8	3.6	3.6	3.4	3.7	3.4	3.5	3.3	3.4	3.2	3.3	(3.1)S
31																								
Median	3.0	(3.1)	3.2	3.2	3.3	3.3	3.3	3.4	3.6	3.5	3.5	3.4	3.4	3.5	3.5	3.5	3.5	3.5	3.3	3.3	3.2	3.2	3.0	3.0
Count	26	24	24	26	25	26	24	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	27	25

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 59

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F1 (Characteristic), ____ (Unit), November (Month), 1953

National Bureau of Standards (Institution)

Observed at Washington, D. C.

Scaled by: E. J. W., Mc C., J. W. P.

Lat 38.7° N, Long 77.1° W

75° W Mean Time

Calculated by: E. J. W., Mc C., J. W. P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	A	(3.9)L	4.2	(3.9)H	3.7	(3.7)S	L	Q							
2									L	L	4.0	L	3.7	3.8	L	L	Q							
3									Q	4.2	4.0	L	(3.7)L	(4.1)L	L	L	Q							
4									L	L	L	L	(3.9)L	L	L	Q	Q							
5									QK	3.5K	3.5K	3.5K	3.6K	3.6K	3.5K	3.7LK	LK							
6									L	L	L	(3.8)L	3.7	(3.5)L	3.8	L	L							
7									L	L	L	L	L	(3.8)H	L	L	Q							
8									L	L	L	L	3.7	L	L	L	Q							
9									Q	L	L	L	4.0	L	L	L	L							
10									L	L	L	L	L	3.8	L	L	L							
11									L	L	L	L	3.9	L	L	L	Q							
12									L	L	L	L	L	L	L	3.8	L							
13									L	L	3.6	3.8	3.8	L	3.8	L	4.1							
14									Q	L	(3.6)L	(3.7)L	3.7	L	L	L	Q							
15									Q	L	L	L	3.6	(3.6)S	L	L	Q							
16									Q	L	L	3.7	3.8	L	L	L	L							
17									L	L	L	(3.9)L	L	L	L	L	Q							
18									L	L	L	L	3.7H	L	L	L	A							
19									Q	L	3.7	3.8	3.8	(3.8)L	L	3.9	Q							
20									Q	L	L	L	L	L	L	L	Q							
21									Q	L	L	A	L	L	L	L	Q							
22									Q	L	L	(3.9)H	L	L	L	L	A							
23									Q	Q	3.8	3.8	L	L	L	L	Q							
24									Q	L	4.2	L	L	3.9	L	L	Q							
25									Q	L	L	L	L	L	L	Q	Q							
26									L	L	L	L	L	4.0	L	L	L							
27									Q	4.1	L	4.0	L	L	L	4.1	Q							
28									Q	L	L	L	L	L	L	L	Q							
29									Q	L	L	L	L	L	L	Q	Q							
30									Q	A	L	3.9	L	4.2	L	Q	Q							
31																								
Median									—	—	3.8	3.8	3.7	3.8	—	—	—							
Count										3	9	12	15	12	4	4	1							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 60

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M1500)E (Characteristic), ______ (Unit), November (Month), 1953

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C., E. J. W.

Calculated by: Mc C., E. J. W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	A	A	A	4.2	A	4.2	4.2	A							
2									3.6^{H}	3.8	3.9	4.0	A	4.0	4.2	4.2	4.1							
3									4.3	4.2	4.1	4.0	4.0	4.0	4.0	4.3	A							
4									A	A	A	A	A	A	$(4.2)^{A}$	$(4.1)^{S}$	4.2^{H}							
5									A^{K}	A^{K}	A^{K}	A^{K}	$(4.0)K^{A}$	4.2^{K}	4.3^{K}	A^{K}	A^{K}							
6									$(4.4)^{A}$	$(4.4)^{A}$	A	A	A	$(4.1)^{A}$	4.2	4.3	$(4.1)^{A}$							
7									$(4.2)^{A}$	A	4.2	4.1	A	A	A	A	A							
8									4.2^{H}	$(4.2)^{F}$	$(4.3)^{A}$	A	A	4.3	4.4^{H}	$(4.4)^{F}$	A							
9									A	A	$(4.4)^{A}$	$(4.2)^{P}$	4.1	4.2	4.2	4.2^{H}	A							
10									$(4.3)^{F}$	4.1	4.0	4.1	4.3^{H}	4.1	4.2^{H}	4.3^{F}	A							
11									A	4.1	4.3	4.0	4.1	A	4.2^{H}	4.5^{H}	A							
12									A	A	A	A	A	A	A	A	A							
13									[illegible]	A	[illegible]	4.2^{H}	4.3	A	A	$(4.3)^{P}$	4.4							
14									[illegible]	$(4.3)^{F}$	[illegible]	4.4	4.0	(4.2)	4.0	[illegible]	$(4.1)^{H}$							
15									[illegible]	$(4.0)^{F}$	$(4.0)^{P}$	4.0	4.0	[illegible]	A	[illegible]	[illegible]							
16									[illegible]	4.2	[illegible]	$(4.2)^{F}$	4.2	(4.3)	[illegible]	[illegible]	[illegible]							
17									[illegible]	4.1^{F}	[illegible]	$(4.0)^{A}$	A	A	[illegible]	[illegible]	[illegible]							
18									[illegible]	[illegible]	[illegible]	$(4.3)^{F}$	B	A	A	[illegible]	[illegible]							
19									A	[illegible]	[illegible]	A	A	[illegible]	A	[illegible]	[illegible]							
20									[illegible]	A	[illegible]	4.1	4.0	[illegible]	[illegible]	[illegible]	[illegible]							
21									[illegible]	4.0	[illegible]	4.3	$(4.3)^{A}$	[illegible]	[illegible]	[illegible]	[illegible]							
22									[illegible]	(4.0)	[illegible]	4.1	4.1	4.2	[illegible]	[illegible]	A							
23									[illegible]	[illegible]	4.2	4.0	4.2	[illegible]	[illegible]	[illegible]	A							
24									[illegible]	[illegible]	4.0	4.2	4.1	[illegible]	4.2	[illegible]	S							
25									[illegible]	[illegible]	[illegible]	[illegible]	$(4.3)^{F}$	[illegible]	A	[illegible]	[illegible]							
26									A	[illegible]	A	4.3	4.2	4.1^{H}	[illegible]	$(4.0)^{F}$	[illegible]							
27									$(4.0)^{P}$	$(4.2)^{F}$	A	A	3.8	4.1	[illegible]	[illegible]	A							
28									3.8^{H}	4.2	4.1	4.3	4.1	4.0	4.2	4.1	[illegible]							
29									A	4.2	A	4.1	A	4.1	4.2	4.2	A							
30									A	4.3	4.4	4.4^{H}	A	A	4.3^{H}	4.4	A							
31																								
Median									4.2	4.2	4.2	4.2	4.1	4.2	4.2	4.2	4.2							
Count									15	18	18	21	19	20	23	23	10							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Table 61

Ionospheric Storminess at Washington, D. C.

November 1953

Day	Ionospheric character* 00-12 GCT	Ionospheric character* 12-24 GCT	Principal storms Beginning GCT	Principal storms End GCT	Geomagnetic character** 00-12 GCT	Geomagnetic character** 12-24 GCT
1	3	2			2	2
2	1	1			2	1
3	2	1			1	2
4	1	1			2	1
5	1	5	0900	----	3	1
6	4	2	----	1100	1	1
7	2	3			2	1
8	2	1			2	2
9	1	1			1	0
10	1	2			0	0
11	1	2			0	2
12	1	0			2	3
13	2	3			5	4
14	1	3			4	4
15	5	1	0300	1200	4	4
16	3	2			4	4
17	1	2			3	3
18	1	1			3	3
19	2	2			4	4
20	2	1			4	4
21	2	1			3	2
22	4	2	0100	1000	2	1
23	2	3			3	3
24	2	1			3	2
25	1	1			3	3
26	2	2			2	1
27	3	1			3	2
28	2	2			1	1
29	2	2			2	0
30	3	2			1	1

*Ionosphere character figure (I-figure) for ionospheric storminess at Washington, D. C., during 12-hour period, on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

**Average for 12 hours of Cheltenham, Maryland, geomagnetic K-figures on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

----Dashes indicate continuing storm.

Table 62

Zürich Provisional Relative Sunspot Numbers

November 1953

Date	R_Z*	Date	R_Z*
1	12	17	0
2	11	18	0
3	10	19	0
4	9	20	0
5	0	21	0
6	0	22	0
7	0	23	0
8	0	24	0
9	0	25	0
10	0	26	0
11	0	27	0
12	0	28	0
13	0	29	0
14	0	30	0
15	0		
16	0	Mean:	1.4

*Dependent on observations at Zürich Observatory and its stations at Locarno and Arosa.

Table 63a

Radio Propagation Quality Figures
(Including Comparisons with Short-Term and Advance Forecasts)

October 1953

Day	North Atlantic 6-hourly quality figures				Short-term forecasts issued about one hour in advance of:				Whole day quality index	Advance forecasts (J-reports) for whole day; issued in advance by:			Geomagnetic K_{Ch}	
	00 to 06	06 to 12	12 to 18	18 to 24	00	06	12	18		1-4 days	4-7 days	8-25 days	Half day (1)	(2)
1	5	6	7	6	5	3	6	6	6	(4)	(4)	X	2	2
2	6	6	7	6	5	5	6	6	6	5	(4)	X	2	1
3	6	6	7	7	6	6	7	7	7	5	5		2	2
4	6	6	7	7	6	6	7	7	7	6	6		1	2
5	6	6	7	6	7	6	7	7	7	6	6		2	1
6	6	6	7	7	7	7	7	7	7	7	6		1	1
7	6	5	7	6	7	6	6	7	6	7	7		3	2
8	6	5	7	7	6	5	7	6	7	7	7		2	3
9	7	6	7	7	5	5	7	7	7	7	7		3	2
10	6	7	7	7	6	6	7	7	7	7	7		2	2
11	7	6	7	7	6	6	7	7	7	7	7		1	2
12	7	6	7	7	7	6	7	7	7	7	7		1	1
13	7	7	7	7	7	7	8	7	7	7	6		1	1
14	6	6	7	7	7	7	7	7	7	7	6		1	1
15	6	6	7	5	7	6	7	(4)	6	6	6		1	(5)
16	(4)	(3)	6	(4)	(3)	(3)	5	5	(4)	(3)	(3)	X	(4)	(4)
17	(3)	(3)	5	(4)	(3)	(3)	(4)	(4)	(3)	(3)	(3)	X	(4)	(4)
18	(3)	(2)	(4)	(4)	(3)	(2)	(4)	(4)	(3)	(3)	(3)	X	(4)	(5)
19	(2)	(2)	(4)	(4)	(2)	(2)	(4)	(3)	(3)	(4)	(4)	X	(6)	(4)
20	(2)	(2)	5	(4)	(2)	(2)	(4)	(4)	(3)	(3)	(4)	X	(4)	(4)
21	(3)	(3)	5	6	(2)	(2)	(4)	5	(4)	(4)	(4)	X	(4)	2
22	(4)	(3)	6	5	(4)	(3)	5	5	(4)	5	5		3	3
23	(3)	(4)	5	5	(3)	(3)	5	5	(4)	(4)	5		3	2
24	(3)	(3)	5	5	(3)	(3)	5	5	(4)	(4)	5		1	2
25	(4)	(4)	7	6	(4)	(4)	5	5	5	5	5		3	2
26	(4)	(4)	7	6	5	(3)	6	7	5	6	6		2	1
27	5	5	6	6	5	(4)	6	5	6	6	6		(4)	2
28	(4)	6	7	6	(4)	(3)	6	6	6	6	6		2	2
29	5	5	7	6	5	5	6	7	6	6	6		2	3
30	6	6	7	6	5	5	7	6	6	6	7		2	1
31	(4)	6	7	6	5	4	6	7	6	7	7		3	1
Score:														
				P	9	9	15	16		14	10			
Quiet periods				S	8	8	13	10		6	9			
				U	1	0	1	0		1	1			
				F	0	3	0	0		1	2			
Disturbed periods				P	9	8	2	3		6	3			
				S	4	3	0	2		3	6			
				U	Q	0	0	0		0	0			
				F	0	0	0	0		0	0			

Scales:

Q-scale of Radio Propagation Quality
- (1) - useless
- (2) - very poor
- (3) - poor
- (4) - poor to fair
- 5 - fair
- 6 - fair to good
- 7 - good
- 8 - very good
- 9 - excellent

K-scale of Geomagnetic Activity
0 to 9, 9 representing the greatest disturbance; $K_{Ch} \geqslant 4$ indicates significant disturbance, enclosed in ( ) for emphasis

Scoring: (beginning October 1952)
- P - Perfect: forecast quality equal to observed
- S - Satisfactory: (beginning October 1952) forecast quality one grade different from observed
- U - Unsatisfactory: forecast quality two or more grades different from observed when both forecast and observed were $\geqslant 5$, or both $\leqslant 5$
- F - Failure: other times when forecast quality two or more grades different from observed

Symbols:
X - probable disturbed date

Note: All times are UT (Universal Time or GCT)

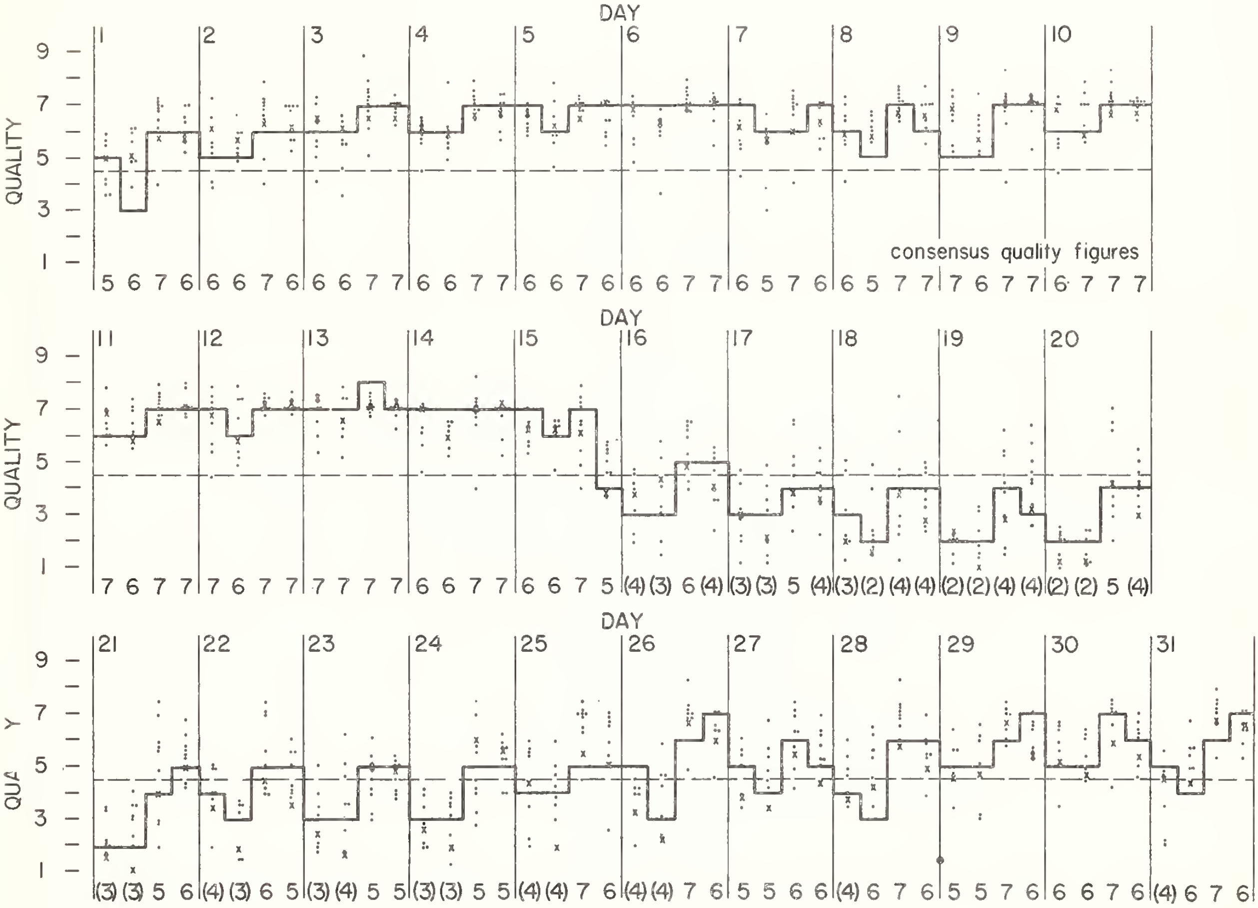
Table 63b

Short-Term Forecasts---October 1953

— forecast

X CRPL observation (not in consensus)

• individual reports of quality (adjusted to CRPL scale)



Outcome of Advance Forecasts (1 to 4 days ahead) --- October 1953

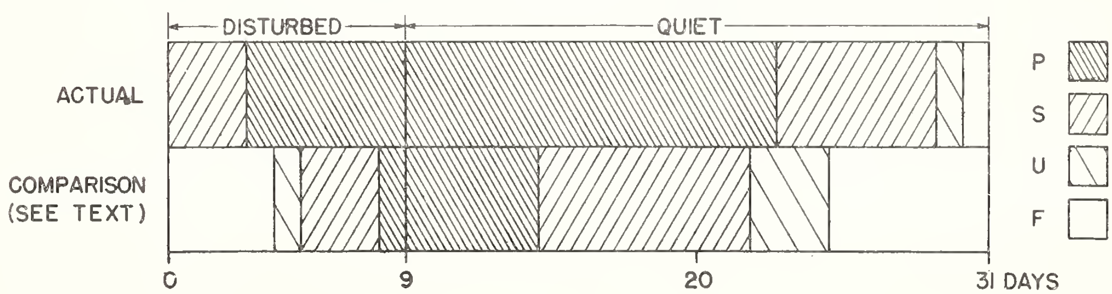


Table 64a

Coronal observations at Climax, Colorado (5303A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	2	1	2	3	4	11	13	1	-	-	2	2	2	1	1	-	-	-	-	-	-	-
2.6	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	1	1	2	3	2	3	4	4	2	1	1	1	1	1	-	-	-	-	-	-	-	-
4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.9	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	1	1	1	2	3	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	1	3	3	1	1	3	9	9	5	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.6	-	-	-	-	-	-	-	-	-	-	-	1	1	3	5	7	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.8	-	-	-	-	-	1	1	1	1	1	1	1	3	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.8	-	-	-	-	-	-	-	3	3	3	3	2	2	-	-	-	-	-	1	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	1	2	3	3	2	1	2	2	-	-	1	1	-	-	1	1	1	-	-	-	2	2	-	-	-	-	-	-	-	-	-
30.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X

Table 65a

Coronal observations at Climax, Colorado (6374A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 1.6	3	2	1	1	1	1	1	1	2	3	4	5	5	5	5	5	5	5	5	5	15	13	14	5	4	2	1	1	2	2	2	2	2	2	2	3	3
2.6	3	3	3	3	1	1	2	2	2	2	3	5	5	5	5	5	5	5	6	6	6	6	7	6	6	4	1	1	2	2	2	2	2	3	3	3	3
4.6	2	2	2	2	1	1	1	1	1	3	4	4	3	2	2	3	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	2	3	3	3	3	3
8.6	2	2	1	1	2	2	1	1	2	2	2	3	3	3	4	4	4	5	6	5	4	4	4	5	5	4	2	2	2	2	2	2	2	3	3	3	3
9.7	3	2	1	1	1	1	1	1	2	3	4	3	2	2	4	4	5	6	6	6	5	5	4	5	5	5	4	2	2	2	2	2	3	3	3	3	2
11.9	2	3	2	2	2	2	1	1	1	3	3	2	2	2	3	5	6	6	5	7	7	7	6	6	6	6	5	2	2	2	2	2	3	3	3	3	3
12.7	2	3	1	1	1	1	1	1	1	1	3	2	2	3	3	3	4	5	5	6	5	5	5	6	5	5	4	2	2	2	2	2	3	3	3	3	2
14.9	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	3	3	3	3	3	3	4	3	3	3	3	1	1	1	1	1	1	1	2	2
15.7	1	-	-	-	-	-	-	-	1	1	1	2	3	1	1	1	1	2	4	3	4	4	5	4	4	4	3	3	2	2	3	3	3	3	3	3	3
16.8	1	1	2	2	2	1	1	1	1	2	2	2	2	2	3	8	1	1	1	4	5	5	5	5	5	4	2	2	2	2	2	2	2	2	2	2	2
17.6	1	2	2	-	-	-	-	-	1	1	2	2	2	2	3	8	7	2	4	5	6	6	5	6	6	6	4	3	1	1	1	1	2	2	3	3	1
20.8	2	2	1	1	1	1	1	1	1	1	2	3	3	2	1	1	2	3	4	5	5	5	4	3	3	3	3	1	1	1	1	1	1	1	1	2	2
25.8	2	2	1	1	1	1	1	1	1	1	1	1	2	3	3	4	5	4	6	9	8	3	4	2	2	1	1	1	1	1	1	1	1	2	2	2	2
28.7	2	1	1	1	1	1	1	1	1	2	4	4	5	5	4	8	9	9	8	4	3	4	5	5	2	1	1	1	1	1	1	2	3	4	4	3	2
30.9	1	1	1	1	1	1	1	1	1	1	2	3	3	2	2	2	3	2	3	4	4	3	4	3	3	2	1	1	1	1	1	1	2	2	2	2	X

Table 66a

Coronal observations at Climax, Colorado (6702A), east limb

The 6702A coronal line was not visible on any of the observation dates in November 1.6 when there was an observed intensity 1 from N05° to S10°.

Table 64b

Coronal observations at Climax, Colorado (5303A), west limb

Date	Degrees south of the solar equator																			Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	5	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	8	11	6	5	3	1	1	1	1	-	-	-	-	-	-	-	-
4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	10	10	5	3	3	2	2	1	1	-	-	-	-	-	-	-
8.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	2	2	-	-	-	2	2	1	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	1	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-
11.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	9	2	3	1	1	2	1	1	1	1	1	2	2	-	-	-	-	-	-	-
14.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.6	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	3	3	3	3	2	2	1	1	1	-	-	-	-	-	-
30.9a	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-

Table 65b

Coronal observations at Climax, Colorado (6374A), west limb

Date	Degrees south of the solar equator																			Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 1.6	3	3	2	2	1	1	1	1	2	4	4	4	3	4	5	5	5	4	3	3	3	1	-	-	1	4	1	1	1	1	1	1	1	2	2	2	3
2.6	3	2	1	1	1	1	1	1	3	4	4	5	5	5	6	5	5	5	3	4	4	3	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3
4.6	3	2	2	2	2	2	1	1	1	1	4	4	5	5	5	5	5	5	4	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
8.6	3	3	3	1	1	1	1	1	2	3	3	3	3	4	4	4	5	4	4	4	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
9.7	2	3	3	2	1	1	1	2	2	3	4	3	2	4	4	4	4	4	4	3	3	3	2	2	2	2	1	1	1	1	1	2	2	2	2	2	3
11.9	3	1	1	1	1	1	1	1	1	2	2	2	2	1	3	4	3	8	7	3	3	3	2	2	2	3	2	1	1	1	1	1	2	2	2	2	2
12.7	2	3	2	2	1	1	1	1	1	2	2	2	2	3	3	3	5	5	6	5	3	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2
14.9	2	1	-	-	-	-	-	-	-	-	-	-	1	2	2	2	3	3	3	4	3	3	3	2	2	1	1	1	1	1	1	1	2	2	2	2	-
15.7	3	2	2	2	2	1	1	1	1	1	1	2	2	2	2	3	4	4	5	4	3	3	2	2	2	1	1	1	1	1	1	1	1	1	2	2	1
16.8	2	2	2	2	1	1	1	1	1	1	1	1	3	4	4	4	4	4	5	3	3	3	2	2	2	2	2	3	2	2	2	2	2	3	2	1	1
17.6	1	1	1	1	1	1	1	1	-	-	-	1	2	3	3	4	4	4	3	3	3	3	2	2	2	3	3	3	2	1	1	1	1	1	1	3	1
20.8	2	1	1	1	1	1	1	1	2	2	2	2	2	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	1	2	2
25.8a	2	1	1	1	1	1	1	1	1	2	3	4	4	4	5	4	7	6	6	6	5	5	5	5	3	2	2	2	2	1	1	2	2	2	2	2	2
28.7	2	2	1	1	1	1	1	1	1	3	5	5	4	5	5	5	5	5	4	3	4	3	2	1	4	2	1	1	1	1	1	1	2	2	2	2	2
30.9a	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	1	1	1	2	1

Table 66b

Coronal observations at Climax, Colorado (6702A), west limb

The 6702A coronal line was not visible on any of the observation dates in November. The position angles included in the plate estimation for November 30.7, were the same as for the 5303A line.

Table 67a

Coronal observations at Sacramento Peak, New Mexico (5303A), east limb

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 2.7	-	-	-	-	-	2	2	3	3	4	4	4	4	3	4	4	3	3	2	5	5	7	8	5	4	3	2	3	3	3	4	3	2	2	-	-	-
3.7	-	-	-	-	-	-	2	3	2	2	3	3	3	2	3	3	4	3	4	3	4	4	4	4	3	2	3	2	4	4	3	4	3	2	-	-	-
4.8a	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	4	3	3	4	4	5	6	5	4	3	3	2	2	4	3	3	-	-	-	-	-	-
7.7	-	-	-	-	-	2	2	3	3	3	3	3	2	3	4	4	5	8	7	4	3	3	2	2	2	-	-	-	2	3	3	2	2	-	-	-	-
8.7	-	-	-	-	-	-	-	-	2	3	2	3	3	3	4	3	4	5	4	4	4	3	2	3	2	2	-	-	2	2	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	2	3	4	3	3	2	3	2	3	3	4	3	3	2	2	2	2	3	3	2	2	2	2	2	-	-	3	2	-	-
11.7	-	-	-	-	-	-	2	3	3	3	4	3	3	4	4	5	4	3	3	2	3	2	-	-	-	-	-	-	2	2	2	2	-	-	-	-	-
12.7	-	-	-	-	-	-	2	3	4	5	4	4	5	4	4	4	3	2	2	2	2	-	-	2	2	-	-	-	2	2	-	-	-	-	-	-	-
13.7	-	-	-	-	-	-	3	4	5	5	6	5	4	5	5	5	4	3	2	3	2	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	2	2	3	4	4	5	4	5	6	8	7	5	3	3	3	3	2	2	3	2	-	-	2	2	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	2	2	3	4	5	4	5	5	7	13	16	7	4	5	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	2	3	4	5	4	4	5	5	11	18	14	8	4	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.7	-	-	-	-	-	-	-	2	3	3	3	3	4	5	8	12	16	5	3	2	2	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
20.8	-	-	-	-	-	3	2	3	3	3	3	3	3	4	4	5	5	4	3	2	2	-	-	-	2	2	3	2	-	-	-	2	3	-	-	-	-
21.9a	-	-	-	-	-	2	2	3	3	3	3	3	2	3	3	2	3	3	3	2	-	2	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	2	3	4	4	4	4	4	5	5	4	5	3	3	3	3	4	3	2	2	3	2	2	5	4	4	3	2	-	-	-	-
23.9a	-	-	-	-	-	-	-	2	3	3	3	2	2	2	3	3	5	5	4	3	5	4	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
24.7	-	-	-	-	-	3	4	5	6	6	4	4	5	5	4	4	3	3	4	8	11	10	4	4	2	2	3	2	3	3	3	2	2	-	-	-	-
25.7	-	-	-	-	-	-	3	5	6	7	7	6	5	4	3	2	2	2	3	13	16	11	6	4	3	2	2	2	3	2	3	2	3	-	-	-	-
26.7	-	-	-	-	-	2	3	5	6	6	5	5	4	4	4	3	4	5	8	7	8	7	6	3	3	2	2	2	3	3	2	3	2	-	-	-	-
28.7	-	-	-	-	2	3	3	4	4	4	3	2	2	3	4	2	3	3	2	3	3	3	3	2	3	2	3	3	-	-	-	-	-	-	-	-	-
29.7	-	-	-	-	-	-	2	3	4	5	3	3	2	3	3	3	2	3	2	3	4	4	3	2	3	2	2	3	2	2	-	-	-	-	-	-	-
30.7	-	-	-	-	-	-	2	3	3	3	3	3	3	4	3	3	2	2	2	2	3	3	3	3	3	2	4	3	5	4	3	2	-	-	-	-	-

Table 68a

Coronal observations at Sacramento Peak, New Mexico (6374A), east limb

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 2.7	3	3	3	2	3	2	2	2	-	3	4	5	5	4	5	8	8	7	8	8	8	7	7	6	5	5	3	3	3	3	3	2	-	2	2	2	3
3.7	3	3	3	2	3	3	-	2	3	3	4	5	4	4	3	3	3	4	5	8	7	8	7	6	5	4	3	2	3	2	-	2	2	2	3	3	4
4.8a	3	2	3	3	2	3	2	2	2	3	4	5	4	4	3	3	2	3	3	5	4	5	3	4	5	5	4	3	2	2	3	2	-	2	2	3	3
7.7	4	5	4	4	3	3	3	3	2	3	4	5	6	8	7	7	6	5	5	5	8	9	9	13	11	10	6	4	4	2	3	2	2	2	3	3	3
8.7	3	4	3	3	2	2	2	-	-	2	4	4	4	5	6	7	8	9	12	11	8	5	6	11	12	12	7	4	4	3	2	2	-	-	3	3	3
9.7	5	6	4	4	4	3	3	2	2	4	8	7	6	4	5	9	10	11	14	13	11	10	7	7	14	13	10	8	4	3	2	2	2	3	2	2	2
11.7	3	3	4	3	3	3	2	2	-	2	5	4	3	3	4	6	8	9	7	8	12	11	6	5	6	11	7	3	2	3	-	-	-	2	3	2	3
12.7	3	5	4	3	4	3	3	-	2	-	10	5	4	4	5	12	12	12	13	11	10	8	9	8	8	9	7	3	-	-	2	3	3	3	2	3	3
13.7	5	5	7	6	5	4	3	4	2	3	8	9	8	5	5	5	5	12	12	11	12	11	11	10	8	8	7	6	5	3	2	2	2	3	2	3	3
14.7	4	3	5	3	3	2	3	2	2	-	6	8	9	7	5	5	5	10	9	8	8	7	8	9	10	12	12	11	7	3	-	2	-	3	3	2	3
15.7	4	2	3	2	3	2	2	-	-	2	5	4	7	5	4	3	4	5	5	6	8	7	7	14	12	8	7	7	5	3	2	-	-	2	3	2	2
16.8	4	3	2	2	3	3	2	2	2	3	3	3	3	3	2	3	14	3	3	5	6	6	7	8	7	7	5	4	3	3	2	-	-	-	2	2	3
17.7	4	3	3	2	2	3	2	2	3	3	3	3	2	2	-	6	14	5	5	10	11	11	10	8	9	8	7	5	3	3	2	2	2	-	-	-	-
20.8	4	3	4	3	2	2	-	-	2	2	4	5	4	4	3	3	4	4	5	9	11	10	8	6	5	5	5	4	3	3	-	-	2	2	3	2	2
21.9a	2	2	2	-	2	2	-	-	2	-	2	3	3	3	2	-	2	3	3	4	5	4	4	3	2	3	2	3	2	2	-	-	-	-	-	-	-
22.7	4	3	4	4	3	2	2	-	-	2	4	5	5	4	3	4	5	11	12	14	13	12	7	6	6	4	5	4	3	2	-	2	2	2	2	3	3
23.9a	-	-	-	-	-	-	-	-	-	-	3	3	3	3	2	-	2	3	2	11	14	5	3	-	3	2	2	3	-	-	-	-	-	-	-	-	-
24.7	3	4	4	3	3	2	2	-	-	-	3	3	4	5	6	6	6	5	16	20	23	20	16	11	5	5	4	3	3	-	2	2	2	3	3	5	3
25.7	4	5	4	4	3	2	2	2	-	-	3	5	6	7	8	9	11	13	14	15	16	14	7	5	4	4	4	5	3	2	2	2	2	3	3	4	4
26.7	3	4	4	3	3	2	2	-	2	2	4	5	8	7	6	6	8	12	20	14	13	10	5	6	4	4	4	3	4	3	2	2	3	3	2	3	3
28.7	3	5	4	3	3	2	3	2	3	2	5	6	7	8	7	6	8	13	14	11	7	4	3	5	6	6	3	3	4	2	2	2	2	3	3	3	3
29.7	4	4	3	3	2	2	2	2	3	3	5	7	7	8	5	5	8	13	14	11	6	5	6	7	6	7	3	2	4	3	2	2	2	3	3	4	3
30.7	4	4	3	4	3	2	2	3	3	5	5	8	7	6	6	5	5	10	10	12	11	8	7	7	7	6	3	2	2	-	-	2	2	3	3	3	3

Table 67b

Coronal observations at Sacramento Peak, New Mexico (5303A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	50	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 2.7	-	-	-	-	2	2	3	2	3	2	2	2	3	2	3	3	3	2	4	11	16	23	26	15	14	10	8	5	6	3	3	3	2	-	-	-	-
3.7	-	-	-	-	-	-	2	3	2	3	2	2	3	3	3	3	4	3	6	11	16	20	30	23	14	11	8	5	4	4	4	3	2	-	-	-	-
4.8	-	-	-	-	-	-	-	-	-	2	3	3	2	2	3	3	3	2	3	4	6	13	18	20	10	8	5	3	4	4	2	2	2	-	-	-	-
7.7	-	-	-	-	-	-	2	2	3	3	3	4	3	4	3	5	5	4	3	5	7	8	11	14	11	8	4	5	6	5	4	4	3	2	-	-	-
8.7	-	-	-	-	-	-	2	3	2	3	4	3	3	3	3	4	4	5	4	5	6	7	8	9	7	6	5	5	5	6	4	4	3	-	-	-	-
9.7	-	-	-	-	-	2	2	3	4	5	3	3	2	3	4	4	5	4	5	5	5	6	6	5	5	4	5	6	8	7	6	4	2	-	-	-	-
11.7	-	-	-	-	-	-	2	3	3	2	3	4	3	3	5	5	6	14	11	4	3	4	5	4	5	4	3	4	4	4	4	3	2	-	-	-	-
12.7	-	-	-	-	-	3	3	4	3	3	4	5	4	5	5	4	5	14	22	11	8	6	6	10	9	5	5	6	7	8	6	3	2	2	-	-	-
13.7	-	-	-	-	-	-	2	2	2	3	4	4	4	3	4	5	8	14	13	7	6	5	6	7	6	5	5	5	7	6	5	4	2	2	-	-	-
14.7	-	-	-	-	-	-	-	2	2	3	4	4	3	4	3	6	10	14	10	5	4	3	4	4	4	3	3	3	5	4	4	4	3	-	-	-	-
15.7	-	-	-	-	-	-	-	-	2	2	4	3	2	3	2	3	5	7	5	3	3	3	4	4	4	4	3	3	2	3	3	3	2	-	-	-	-
16.8	-	-	-	-	-	-	-	2	2	3	3	3	3	2	2	2	3	4	3	3	2	2	2	2	3	2	2	3	3	2	2	2	-	-	-	-	-
17.7a	-	-	-	-	-	-	-	-	-	-	2	3	2	3	2	2	2	-	2	3	3	4	4	3	2	2	3	2	3	3	2	-	-	-	-	-	-
20.8	-	-	-	2	-	2	-	-	2	3	2	2	3	2	3	2	2	3	3	4	5	4	3	2	3	2	2	2	3	2	2	-	-	-	-	-	-
21.9a	-	-	-	-	-	-	-	-	-	-	3	3	2	-	-	-	-	-	-	2	3	3	3	2	2	2	2	3	3	2	2	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	2	3	4	4	4	3	3	2	2	3	3	3	3	3	3	2	-	-	-	-	-	-
23.9a	-	-	-	-	-	-	-	-	-	-	3	3	2	2	-	-	2	3	3	-	-	-	-	-	-	-	-	3	3	2	-	-	-	-	-	-	-
24.7	-	-	-	-	-	-	-	-	-	-	3	3	2	3	2	3	3	4	4	2	3	2	3	2	3	3	4	3	3	4	2	2	2	-	-	-	-
25.7	-	-	-	-	-	-	-	-	2	3	3	3	2	-	-	-	-	-	-	-	-	-	2	2	3	3	3	3	4	4	3	3	2	-	-	-	-
26.7	-	-	-	-	-	-	-	-	2	2	3	3	3	2	3	3	3	2	2	3	3	3	4	3	2	3	3	3	4	4	5	2	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	2	2	2	2	2	3	7	8	4	4	4	3	2	2	3	2	-	-	-	-	-	-
29.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	2	2	4	8	13	11	8	7	5	4	3	4	3	4	3	2	2	-	-	-	-
30.7	-	-	-	-	-	-	2	2	3	2	2	2	2	3	3	3	2	3	3	4	5	11	14	14	13	7	5	6	5	4	4	3	2	2	-	-	-

Table 68b

Coronal observations at Sacramento Peak, New Mexico (6374A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 2.7	3	3	3	3	3	2	2	2	3	4	7	6	5	7	8	8	7	9	8	5	4	4	3	2	2	3	4	3	-	2	2	-	-	2	2	3	3
3.7	4	3	3	3	3	2	-	2	2	3	4	5	6	8	14	13	12	11	12	5	4	8	10	2	-	-	2	-	2	3	2	2	3	3	4	4	3
4.8	3	2	2	2	-	2	-	2	-	2	2	3	5	6	8	7	7	6	5	4	4	3	5	2	-	-	3	-	-	2	2	3	2	2	2	3	3
7.7	3	3	2	5	2	3	3	2	2	3	3	3	3	4	5	4	5	6	8	5	5	4	3	2	3	7	8	4	-	-	-	-	2	3	3	5	4
8.7	3	3	3	4	4	2	2	-	-	2	3	3	4	4	5.	5	6	8	9	5	4	3	3	2	3	6	5	4	2	2	2	2	3	3	4	3	3
9.7	2	3	4	3	4	2	2	2	2	4	6	7	6	6	6	7	7	8	9	8	5	4	5	4	4	4	4	4	5	3	3	3	3	3	5	7	5
11.7	3	2	3	2	3	3	2	2	2	3	4	4	4	4	5	6	7	6	18	11	8	5	3	4	3	5	4	3	2	2	2	3	3	3	4	3	3
12.7	3	3	4	4	2	3	2	2	3	3	4	4	3	4	4	6	7	8	11	16	13	10	5	4	3	8	7	6	4	2	-	-	2	3	3	3	3
13.7	3	3	4	3	2	2	-	-	2	2	4	2	3	4	5	4	5	8	17	14	5	4	4	3	3	7	6	5	3	2	-	3	4	4	4	5	5
14.7	3	3	4	4	3	2	2	3	2	2	3	2	3	5	5	4	4	10	11	10	8	7	5	5	4	4	5	4	3	3	2	2	2	3	3	3	4
15.7	2	2	2	3	2	2	-	2	-	2	-	2	3	5	8	7	6	8	7	8	7	7	6	4	5	5	4	4	3	2	2	-	3	2	3	4	4
16.8	3	3	3	3	3	2	-	-	2	3	2	2	2	5	7	7	7	8	8	10	7	5	5	4	4	4	3	3	4	3	2	-	-	2	3	3	4
17.7a	-	2	3	3	3	-	-	2	2	3	-	-	3	4	4	4	4	4	4	5	4	4	4	3	3	3	4	3	3	2	-	-	-	-	2	3	4
20.8	2	3	3	3	3	3	-	-	2	2	3	3	4	5	5	5	4	4	4	5	6	3	4	3	5	4	8	7	5	4	3	2	2	3	2	2	4
21.9a	-	-	-	-	-	-	-	-	-	-	2	2	3	3	2	-	-	-	2	3	4	3	2	3	3	3	3	3	-	2	-	-	-	2	2	-	2
22.7	3	4	3	3	2	2	-	-	2	3	5	4	4	4	4	3	3	3	4	5	8	9	8	7	6	7	8	5	4	2	2	2	2	3	3	2	4
23.9a	-	-	-	-	-	-	-	-	-	-	2	3	3	3	3	3	4	2	2	3	3	5	6	4	2	2	3	2	-	-	-	-	-	-	-	-	-
24.7	3	4	4	2	3	2	3	-	-	3	2	3	3	2	3	-	-	2	3	4	5	5	5	6	4	3	4	4	2	3	2	-	3	2	2	3	3
25.7	4	3	5	4	3	2	2	2	2	3	5	7	8	7	6	4	11	14	13	14	13	12	11	8	9	6	4	5	4	3	2	2	2	2	-	3	4
26.7	3	3	3	2	3	2	-	2	-	2	8	10	9	8	8	7	6	13	14	13	12	11	8	5	4	4	5	6	4	2	2	2	3	3	4	3	3
28.7	3	4	3	3	-	2	2	2	2	6	7	8	9	5	6	7	7	7	14	11	10	7	5	4	4	7	6	4	4	3	2	3	3	3	2	3	3
29.7	3	4	4	3	4	3	3	2	2	5	6	7	5	4	5	8	10	10	8	4	4	5	3	3	2	3	5	4	4	2	2	2	3	3	3	5	4
30.7	3	4	4	3	3	2	2	2	2	3	5	8	10	7	7	8	11	12	10	8	4	3	2	2	3	2	4	4	3	2	-	2	-	2	3	4	4

Table 69a

Coronal observations at Sacramento Peak, New Mexico (6702A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 69b

Coronal observations at Sacramento Peak, New Mexico (6702A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																					
Nov. 2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	2	-	-	-	-	-	-	-	-	-	-
7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-

Table 70a

Sudden Ionosphere Disturbances Observed at Washington, D. C.

October 1953

1953 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
October 24	1322	1420	Ohio, England	0.1	

*Ratio of received field intensity during SID to average field intensity before and after, for station KQ2XAU, (formerly W8XAL), 6080 kilocycles, 600 kilometers distant.

Table 70b

Sudden Ionosphere Disturbances Observed at Washington, D. C.

November 1953

No sudden ionosphere disturbances were observed during the month of November.

Note: Observers are invited to send to the CRPL information on times of beginning and end of sudden ionosphere disturbances for publication as above. Address letters to the Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Table 71

Solar Flares, November 1953

No solar flares were reported for the month of November 1953.

Table 72

Indices of Geomagnetic Activity for October 1953

Preliminary values of international character-figures, C;
Geomagnetic planetary three-hour-range indices, Kp;
Magnetically selected quiet and disturbed days

Gr. Day 1953	C	Values Kp three-hour interval 1 2 3 4	5 6 7 8	Sum	Final Selected Days
1	0.8	3o 5- 2+ 2-	3+ 2- 3o 1+	21o	Five
2	0.4	2- 1+ 1- 2-	2- 2+ 2- 1o	12o	Quiet
3	0.3	1- 3- 2- 2+	2o 2- 1o 2-	14-	
4	0.2	2o 1o 0+ 1+	1o 1o 2- 1+	10-	5
5	0.0	1- 1+ 1+ 2-	0+ 0+ 1o 1-	7+	6
					12
6	0.2	2- 1o 2- 1o	1+ 1- 1+ 1o	10-	13
7	0.7	2o 1- 5- 3o	3+ 1+ 0+ 3-	18o	14
8	0.7	2- 2+ 3- 2+	2o 2- 2- 4o	18+	
9	0.5	2o 3+ 3+ 2+	1+ 1+ 1+ 2o	17o	
10	0.6	3o 2o 1o 1-	2- 3- 4- 3-	17+	
11	0.5	1- 1o 1- 2-	3o 3+ 2+ 1o	14-	Five
12	0.2	1- 1o 1- 1o	1- 0+ 2o 1+	8-	Disturbed
13	0.1	1- 1o 0+ 1+	1- 2- 1+ 2-	9-	
14	0.0	1- 2o 1o 0+	0+ 1- 0+ 0o	5+	15
15	1.6	0o 0o 2o 2-	6o 7+ 6- 5+	28o	16
					18
16	1.6	6o 5- 4o 2+	3- 5- 6- 6o	36o	19
17	1.4	5- 4- 4+ 4+	4- 5+ 4+ 4o	34+	20
18	1.5	4+ 5- 5o 4+	5+ 6o 5+ 5+	40+	
19	1.6	6+ 5+ 6- 6o	5+ 5- 4+ 4-	41+	
20	1.4	4+ 5+ 5- 4o	5- 5- 5- 5-	37o	
21	1.0	3+ 3o 5+ 6-	4+ 3- 1+ 2o	28-	Ten
22	0.9	2- 4+ 5- 3+	3o 4o 3o 2+	26+	Quiet
23	0.6	3o 4o 3+ 3-	2+ 3- 2o 1o	21o	
24	0.7	0+ 0+ 2+ 3-	5- 2+ 1o 1+	15o	2
25	0.3	3- 4- 2o 2+	2- 1o 2- 2o	17o	3
					4
26	0.1	1+ 2- 2+ 2o	0+ 0+ 2- 1+	11o	5
27	0.8	4- 3o 4+ 3o	2+ 3- 4- 3-	25+	6
28	0.4	3+ 2+ 1o 1+	0+ 2- 2o 2o	14o	12
29	0.6	2+ 3o 2- 1+	2o 3- 3o 4o	20o	13
30	0.3	3o 2- 2- 2o	1+ 1o 2o 1o	14-	14
31	0.2	3+ 3o 3o 1-	1o 1o 0o 0+	12+	26
					30
Mean:	0.65				

GRAPHS OF IONOSPHERIC DATA

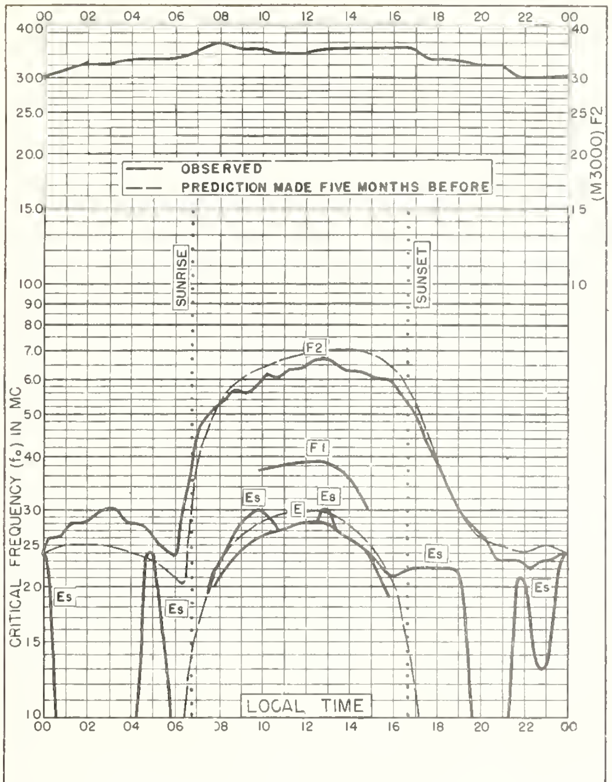


Fig. I. WASHINGTON, D. C.
38.7° N, 77.1° W NOVEMBER 1953

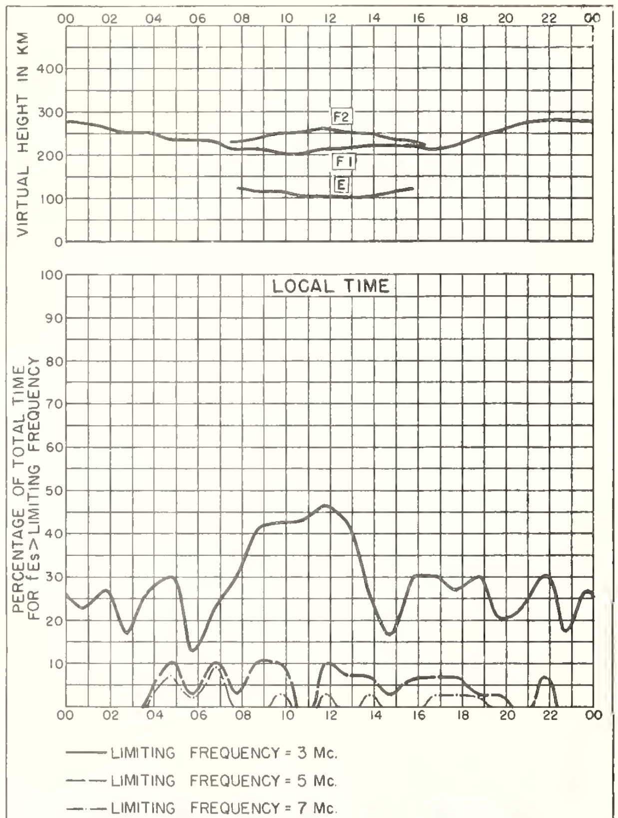


Fig. 2. WASHINGTON, D. C. NOVEMBER 1953

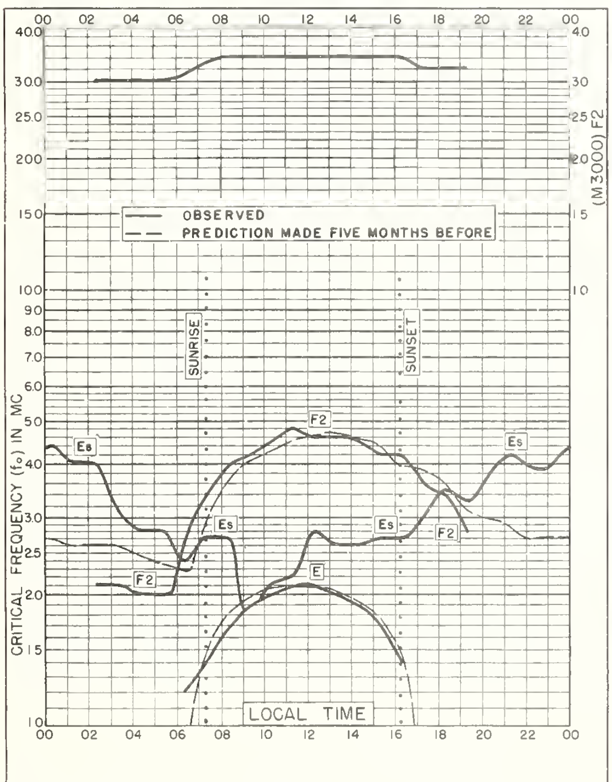


Fig. 3. TROMSO, NORWAY
69.7° N, 19.0° E OCTOBER 1953

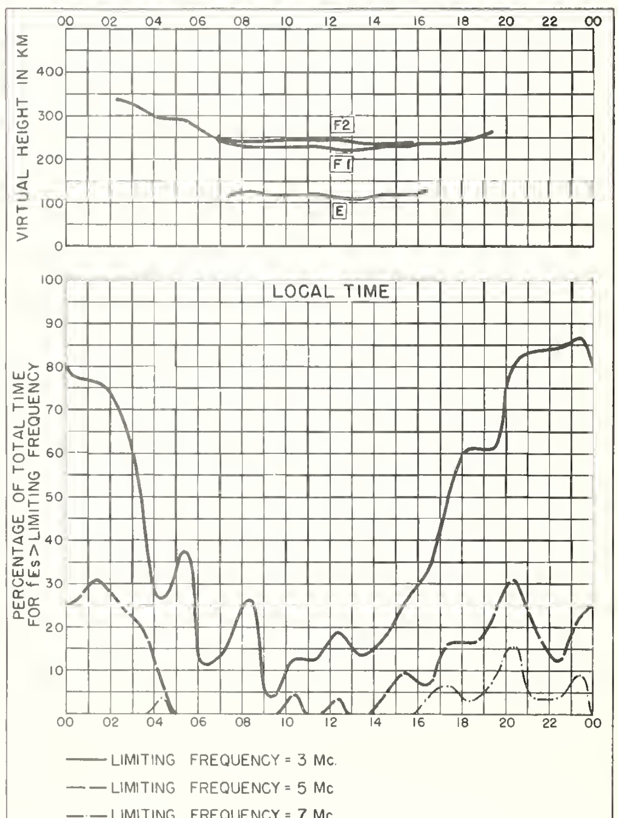


Fig. 4. TROMSO, NORWAY OCTOBER 1953

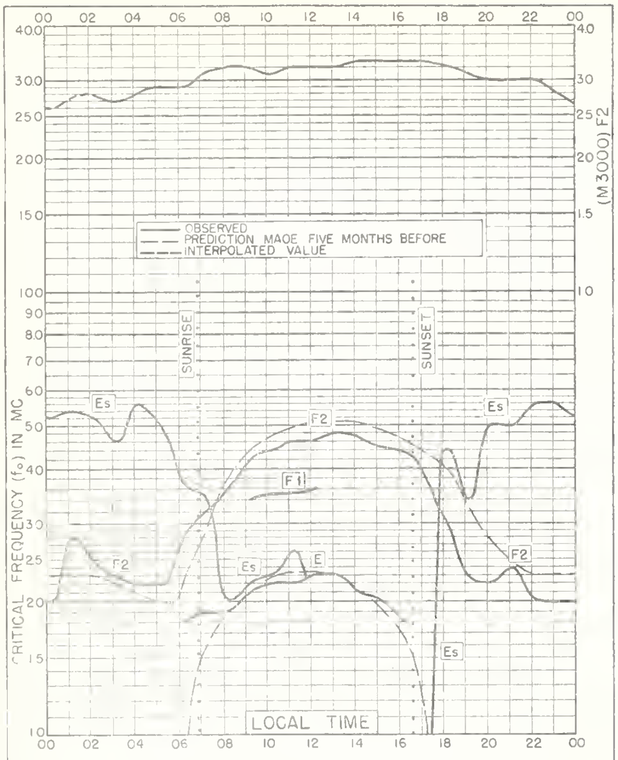


Fig. 5. FAIRBANKS, ALASKA
64.9°N, 147.8°W OCTOBER 1953

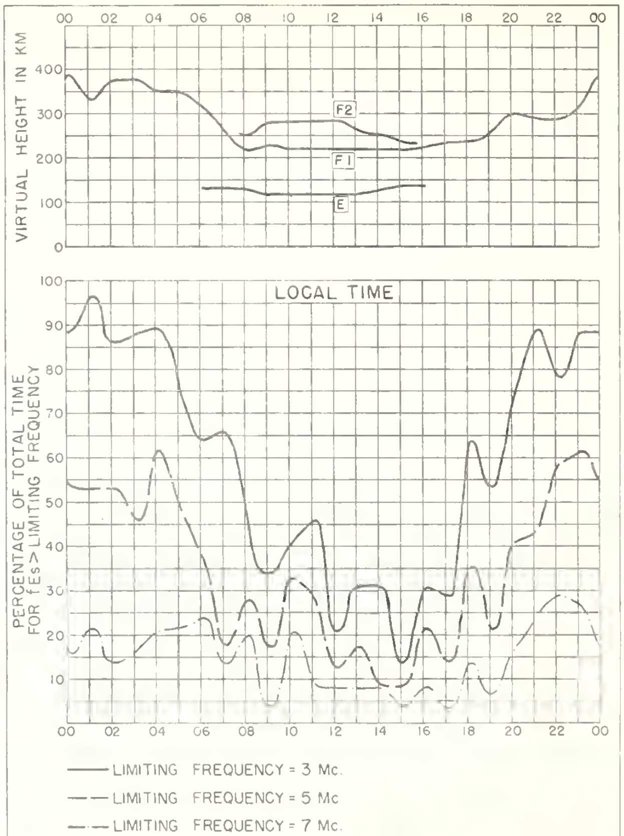


Fig 6 FAIRBANKS, ALASKA OCTOBER 1953

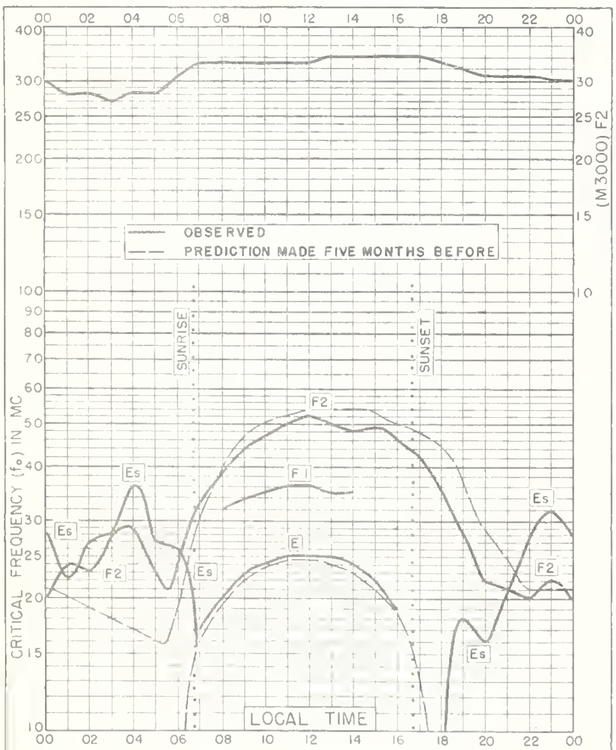


Fig. 7 ANCHORAGE, ALASKA
61.2°N, 149.9°W OCTOBER 1953

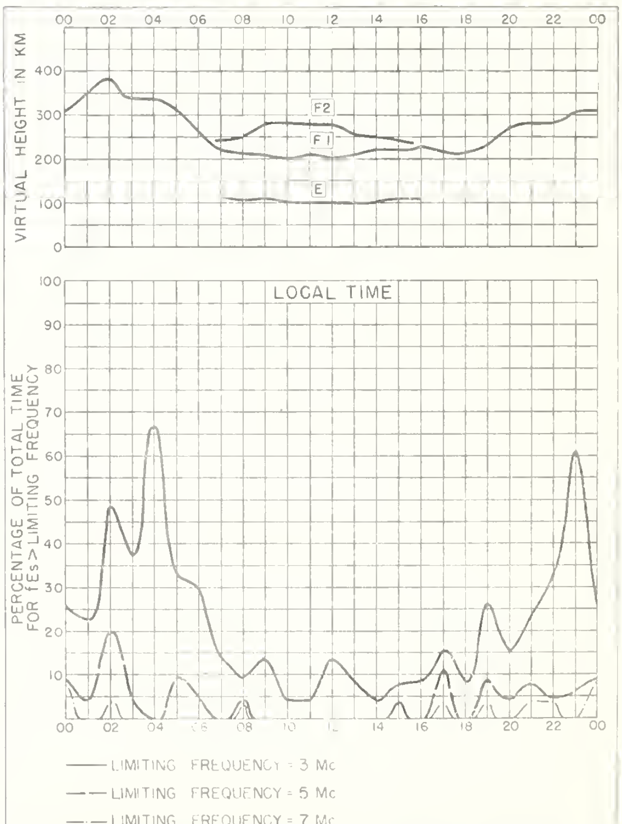


Fig. 8 ANCHORAGE, ALASKA OCTOBER 1953

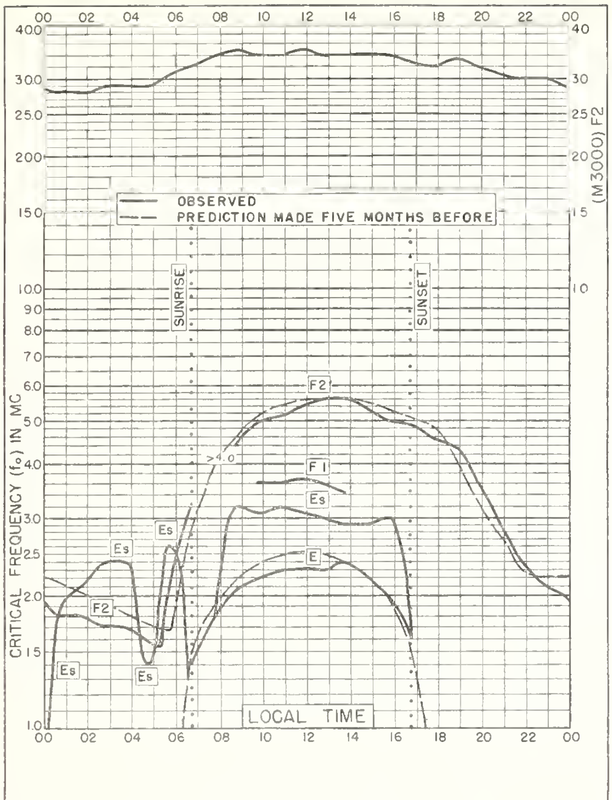


Fig. 9 OSLO, NORWAY
60.0° N, 11.1°E
OCTOBER 1953

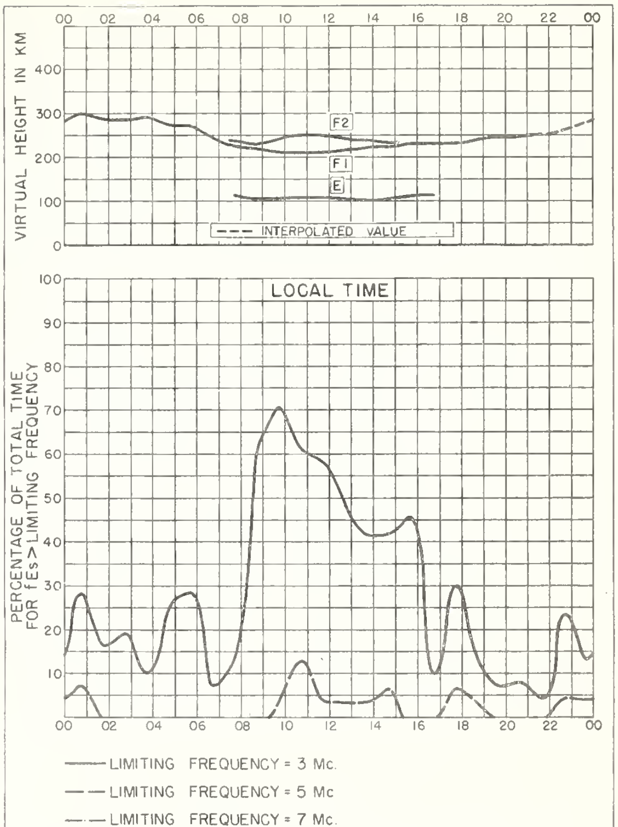


Fig. 10 OSLO, NORWAY
OCTOBER 1953

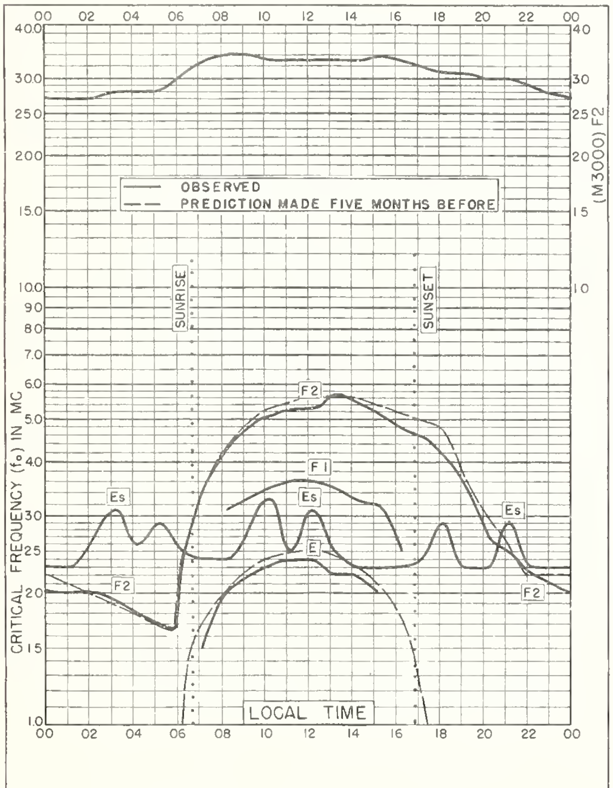


Fig. 11 UPSALA, SWEDEN
59.8°N, 17.6°E
OCTOBER 1953

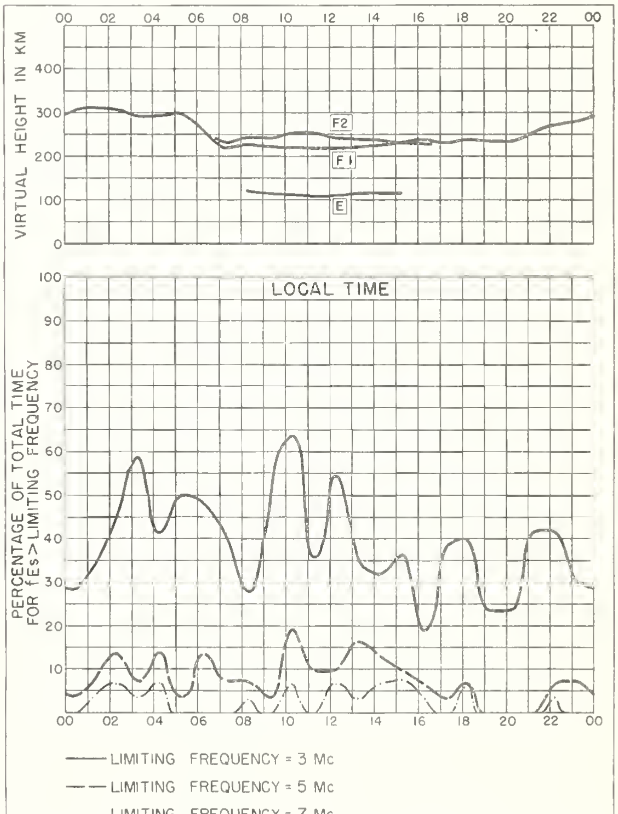


Fig. 12 UPSALA, SWEDEN
OCTOBER 1953

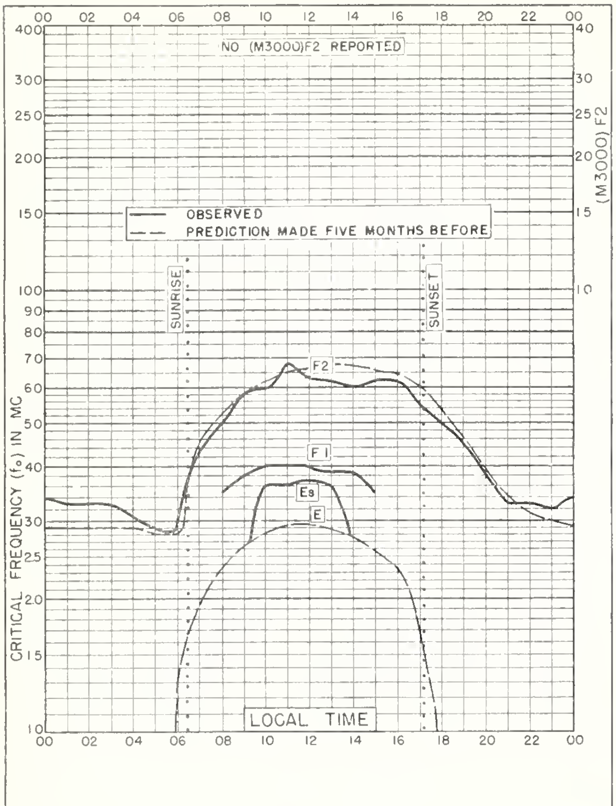


Fig. 13 GRAZ, AUSTRIA
47.1°N, 15.5°E OCTOBER 1953

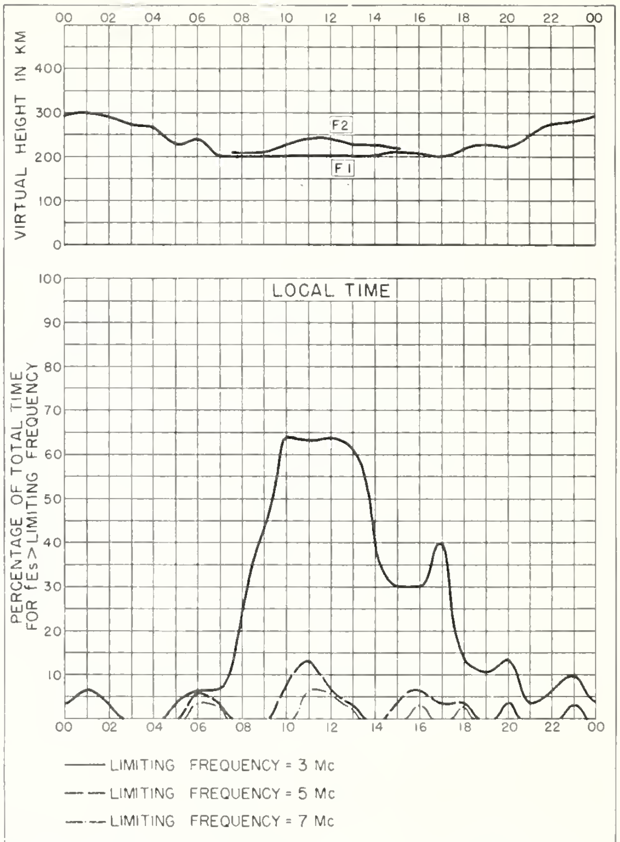


Fig. 14 GRAZ, AUSTRIA OCTOBER 1953

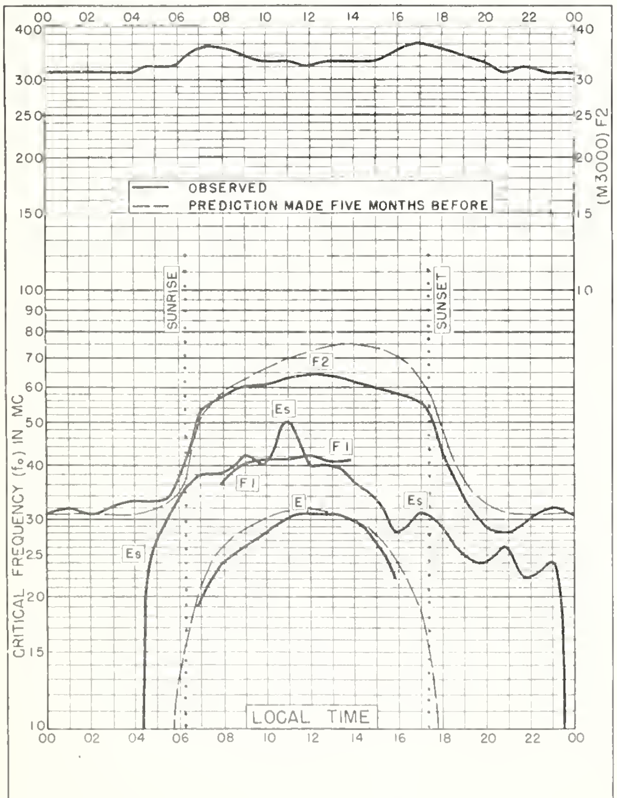
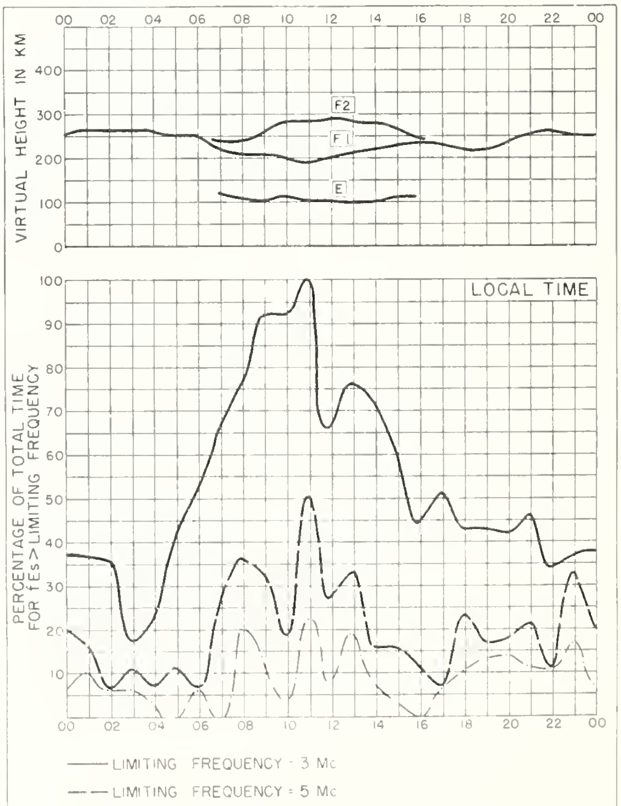


Fig 15 SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W OCTOBER 1953



OCTOBER 1953
Fig. 16 SAN FRANCISCO, CALIFORNIA

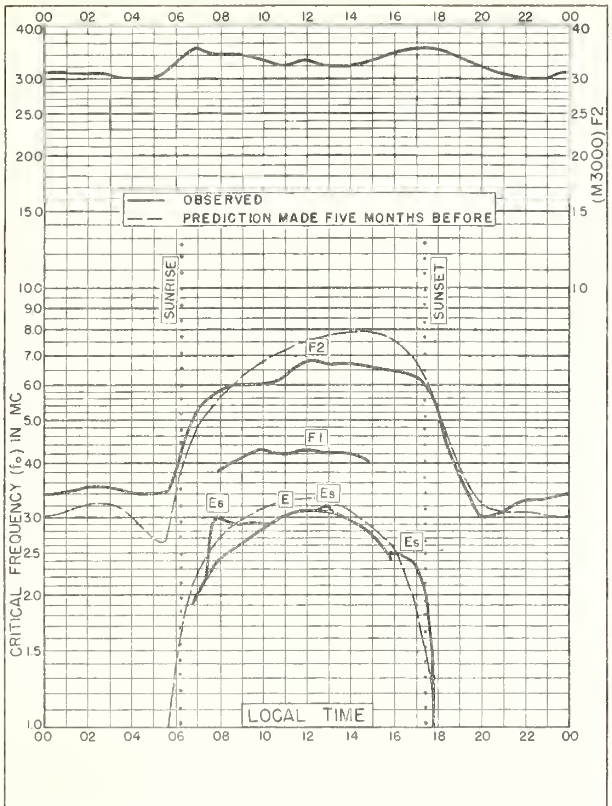
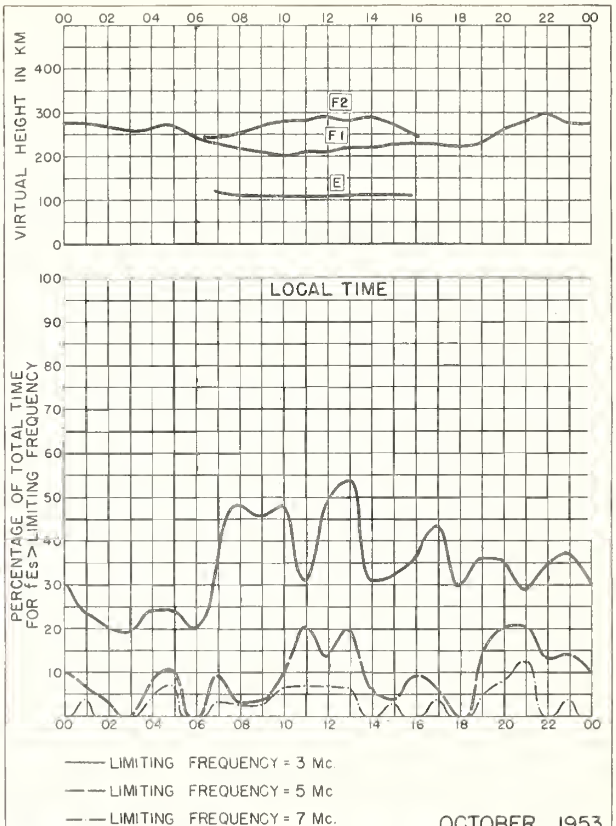


Fig. 17. WHITE SANDS, NEW MEXICO
32.3° N, 106.5° W OCTOBER 1953



OCTOBER 1953
Fig. 18. WHITE SANDS, NEW MEXICO

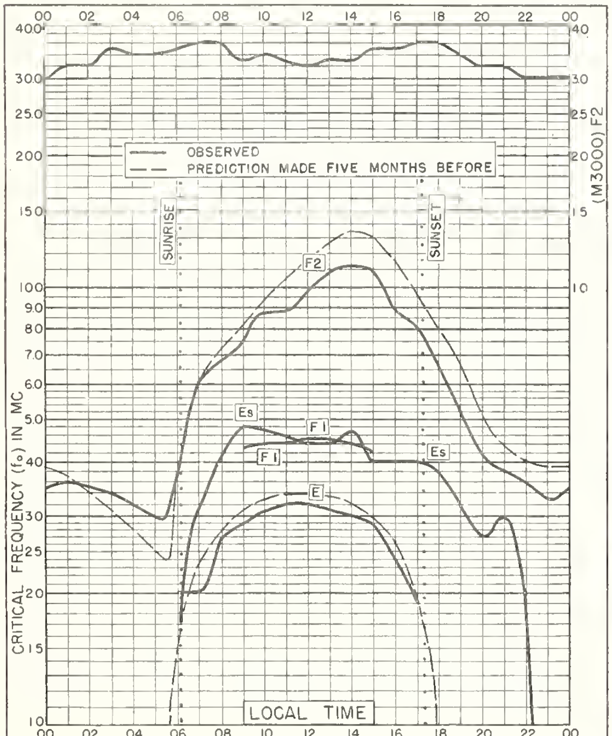


Fig. 19. OKINAWA I.
26.3° N, 127.8° E OCTOBER 1953

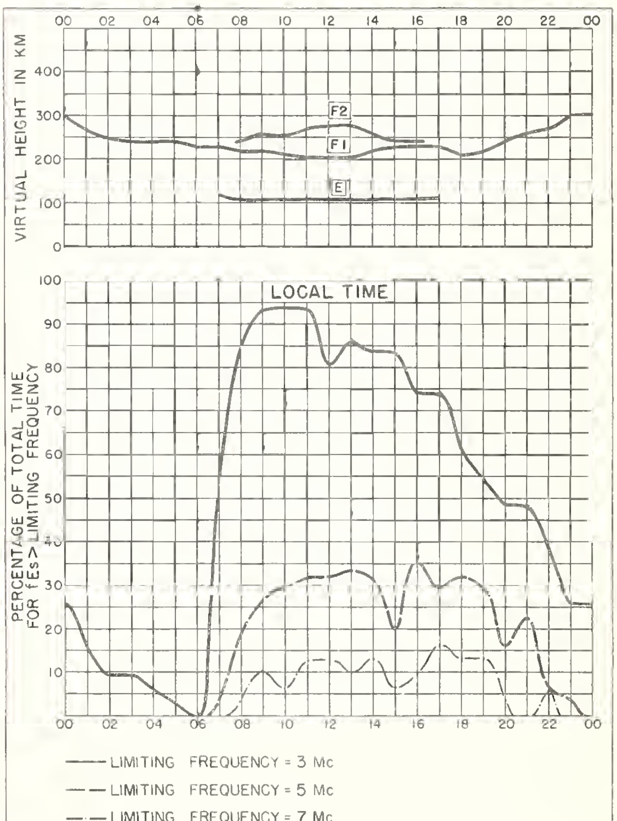


Fig. 20. OKINAWA I. OCTOBER 1953

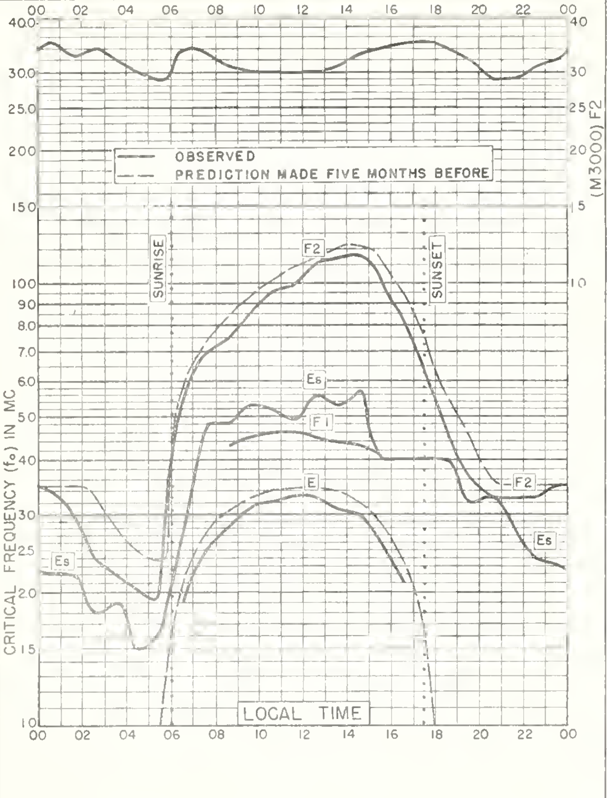


Fig. 21 MAUI, HAWAII
20.8°N, 156.5°W OCTOBER 1953

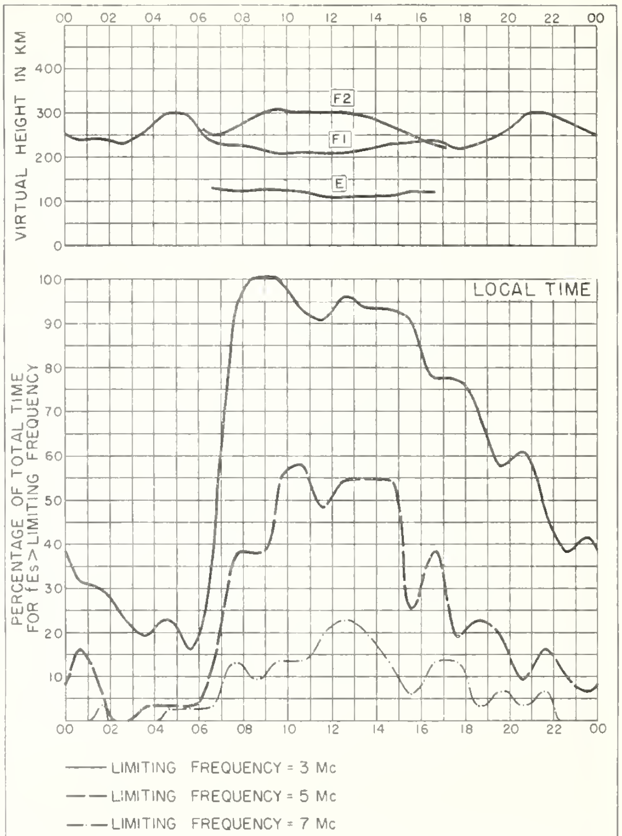


Fig. 22 MAUI, HAWAII OCTOBER 1953

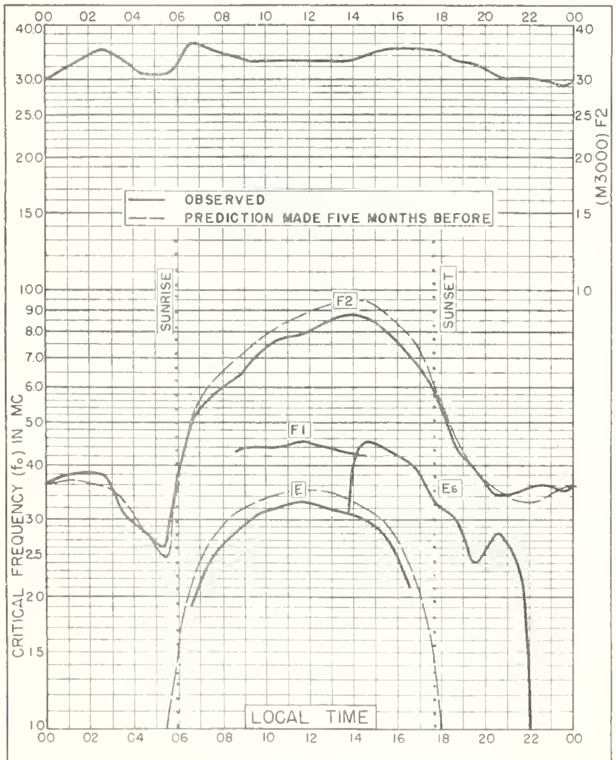


Fig. 23 PUERTO RICO, W. I.
18.5° N, 67.2° W OCTOBER 1953

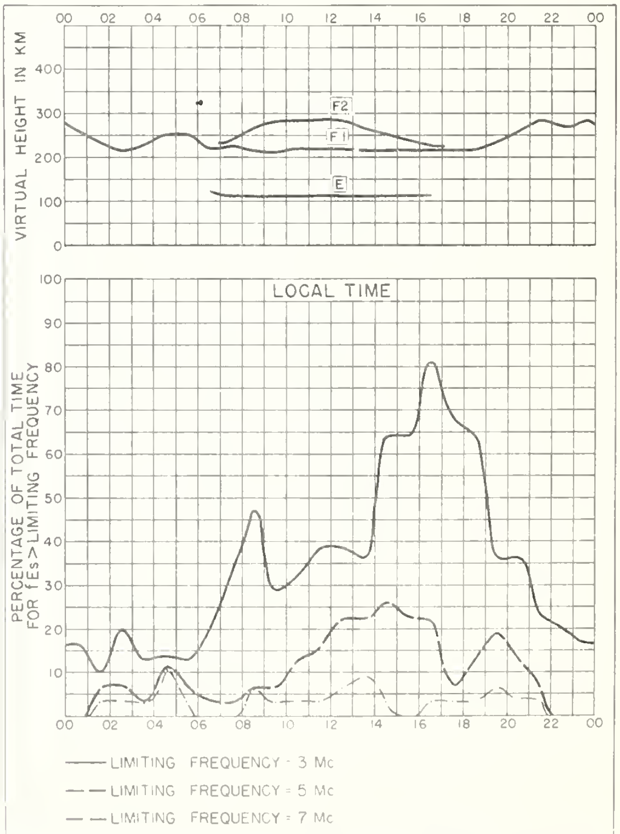


Fig. 24 PUERTO RICO, W. I. OCTOBER 1953

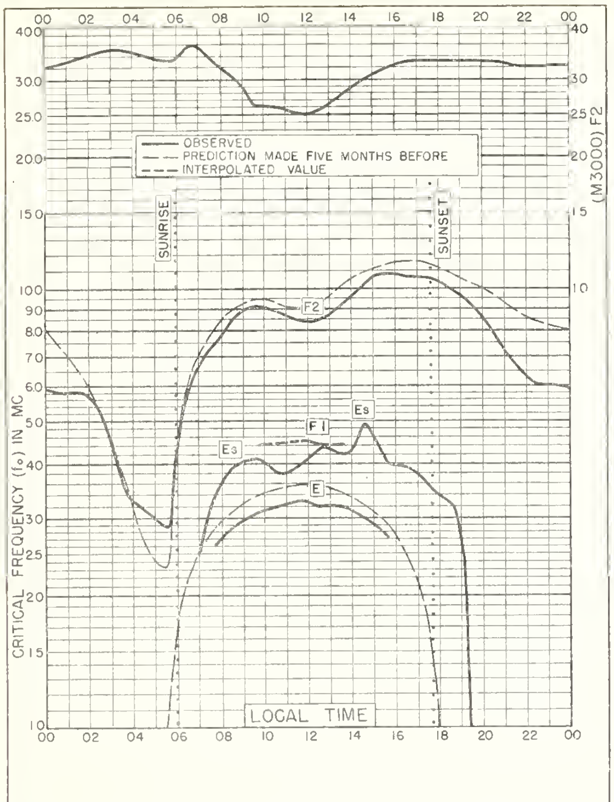


Fig. 25 GUAM I.
13.6° N, 144.9°E OCTOBER 1953

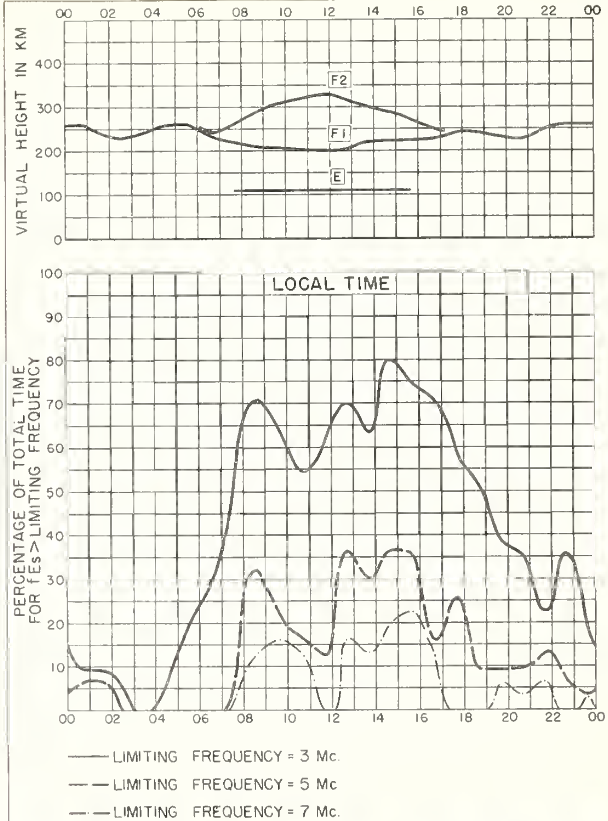


Fig. 26 GUAM I. OCTOBER 1953

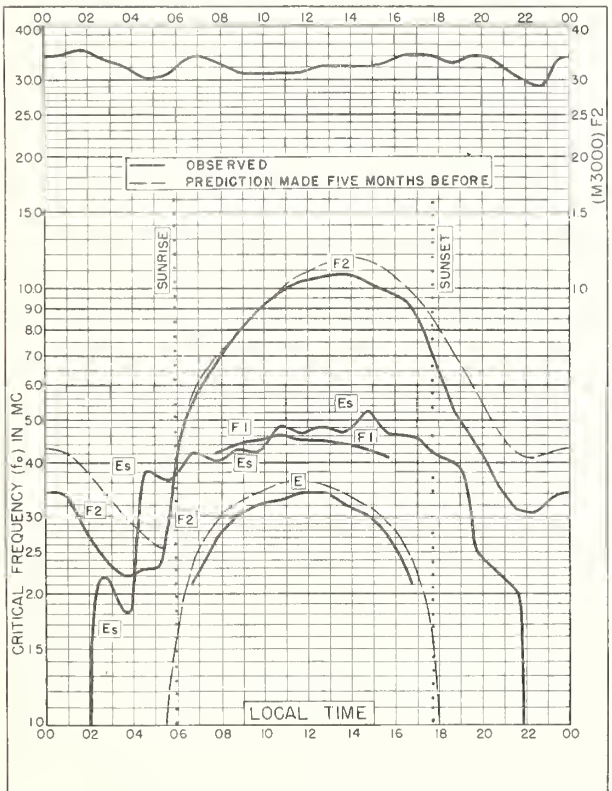


Fig. 27 PANAMA CANAL ZONE
9.4°N, 79.9°W OCTOBER 1953

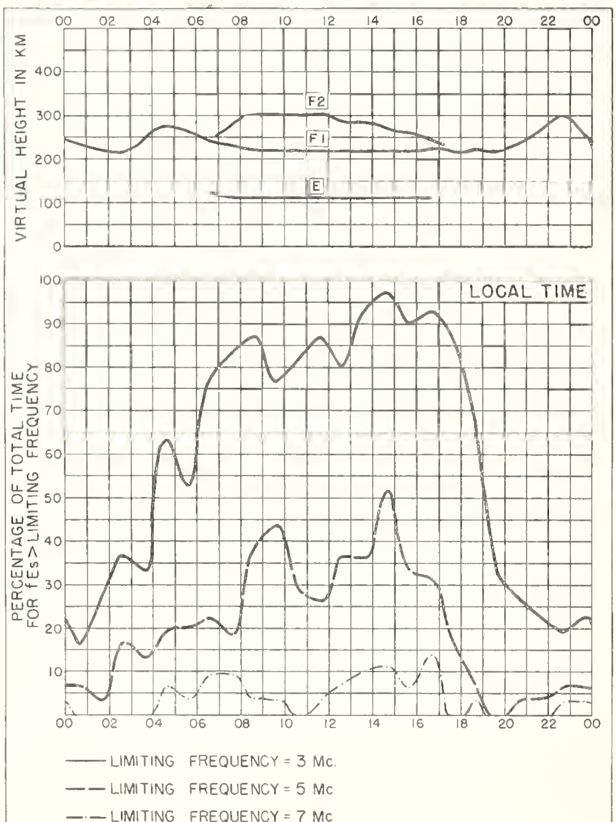


Fig. 28 PANAMA CANAL ZONE OCTOBER 1953

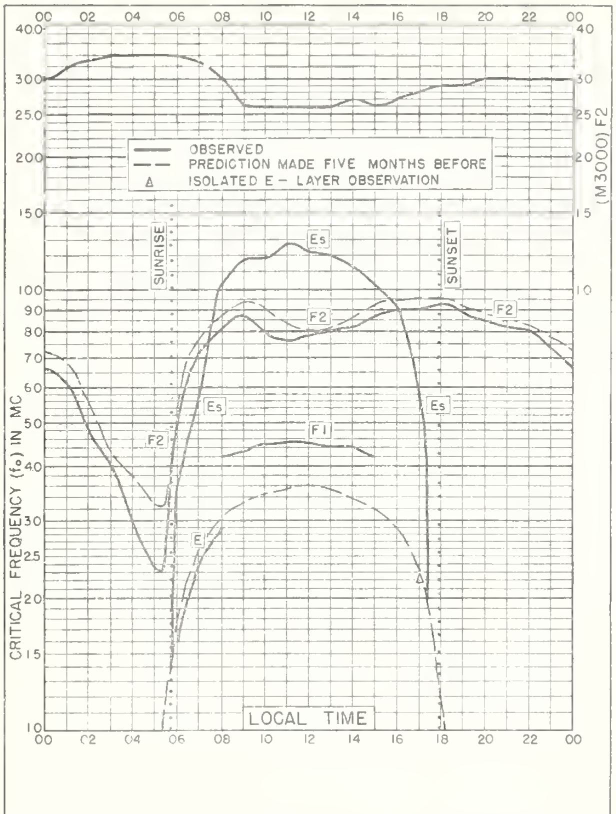


Fig. 29. HUANCAYO, PERU
12.0°S, 75.3°W OCTOBER 1953

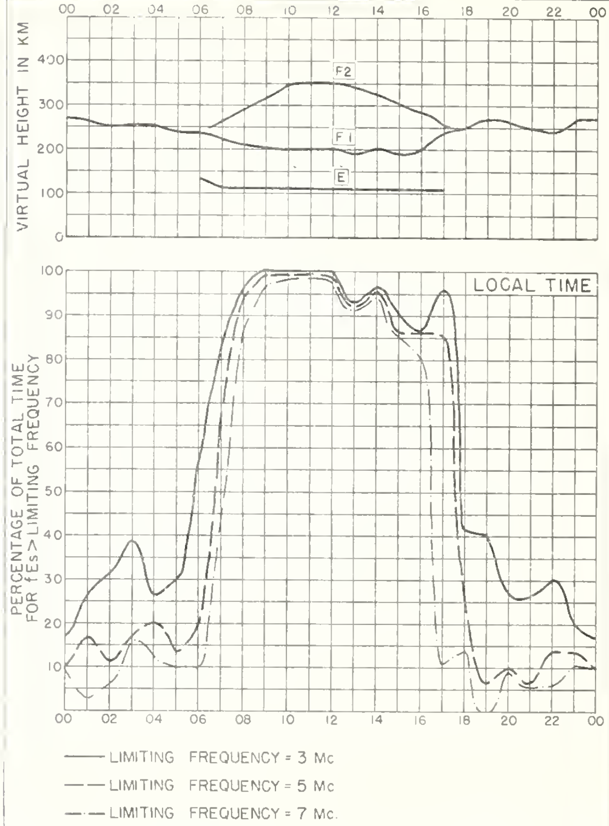


Fig. 30. HUANCAYO, PERU OCTOBER 1953

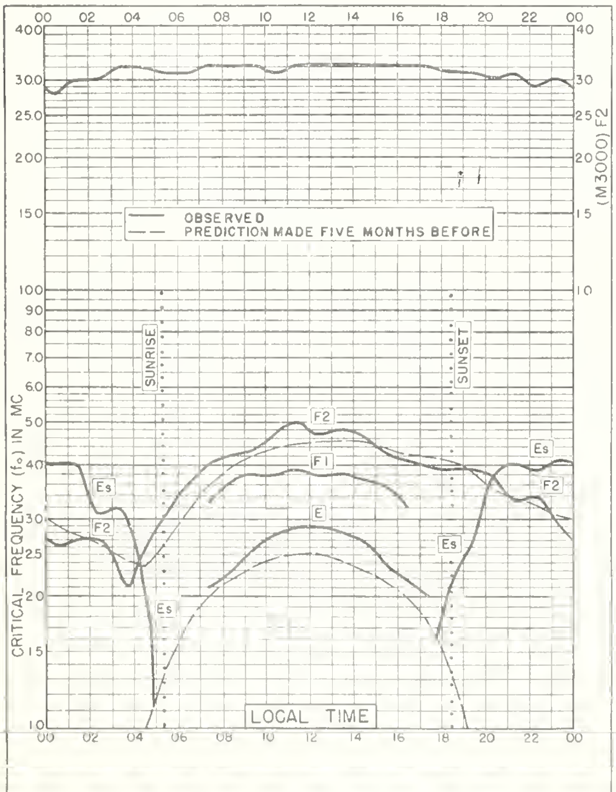


Fig. 31 KIRUNA, SWEDEN
67.8°N, 20.5°E SEPTEMBER 1953

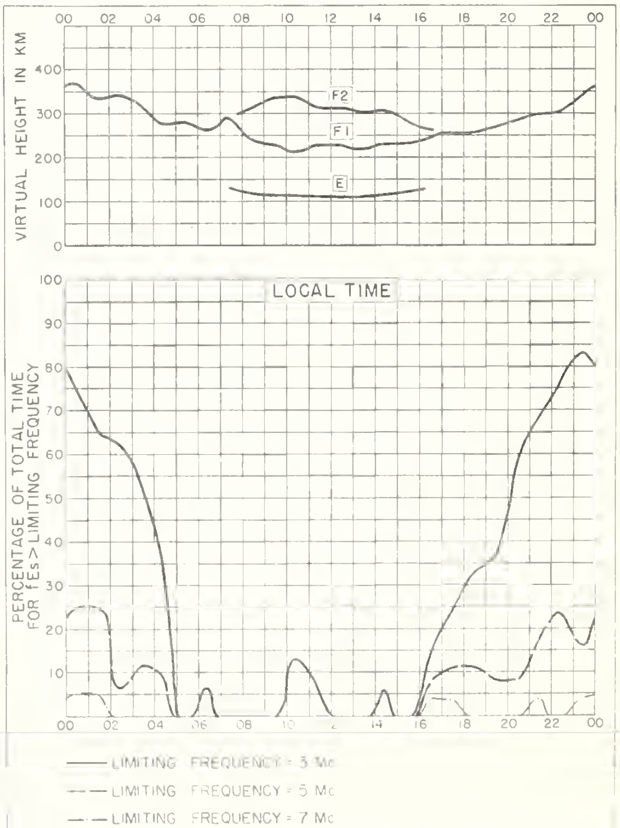


Fig. 32 KIRUNA, SWEDEN SEPTEMBER 1953

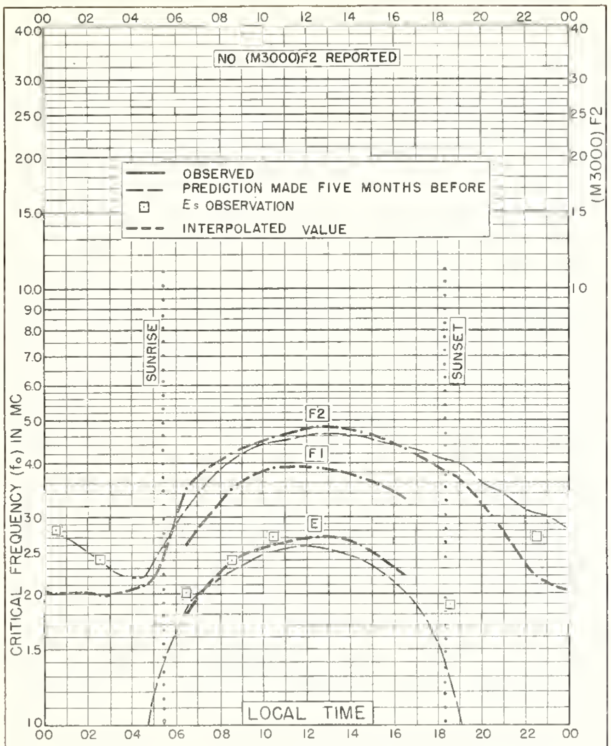


Fig. 33. LULEA, SWEDEN
65.6° N, 22.1° E SEPTEMBER 1953

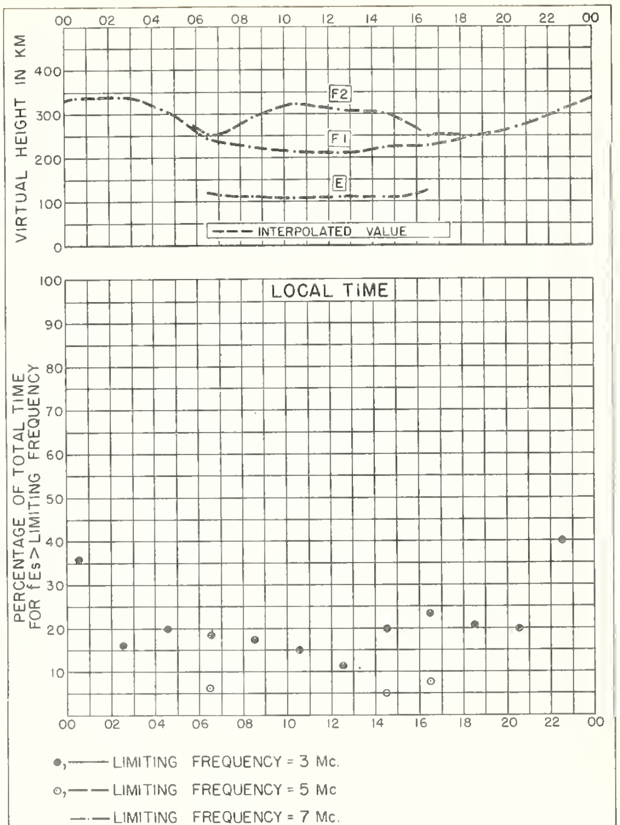


Fig. 34. LULEA, SWEDEN SEPTEMBER 1953

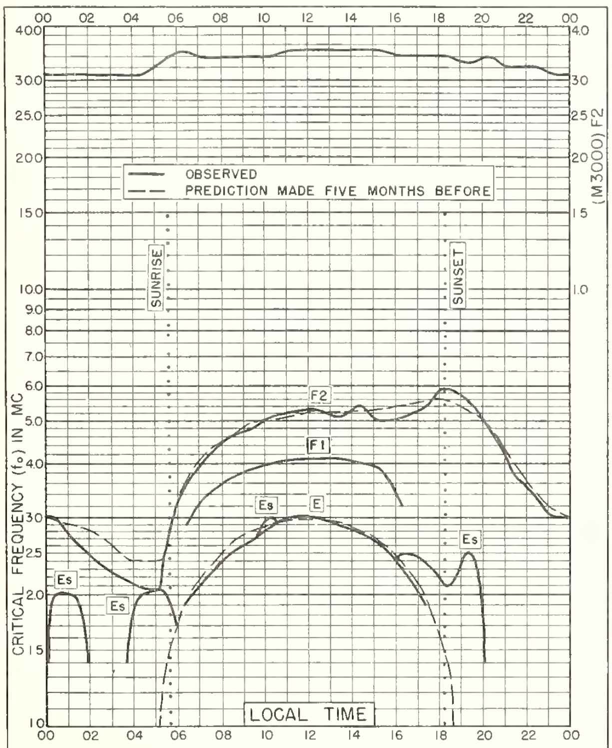


Fig. 35. De BILT, HOLLAND
52.1°N, 5.2°E SEPTEMBER 1953

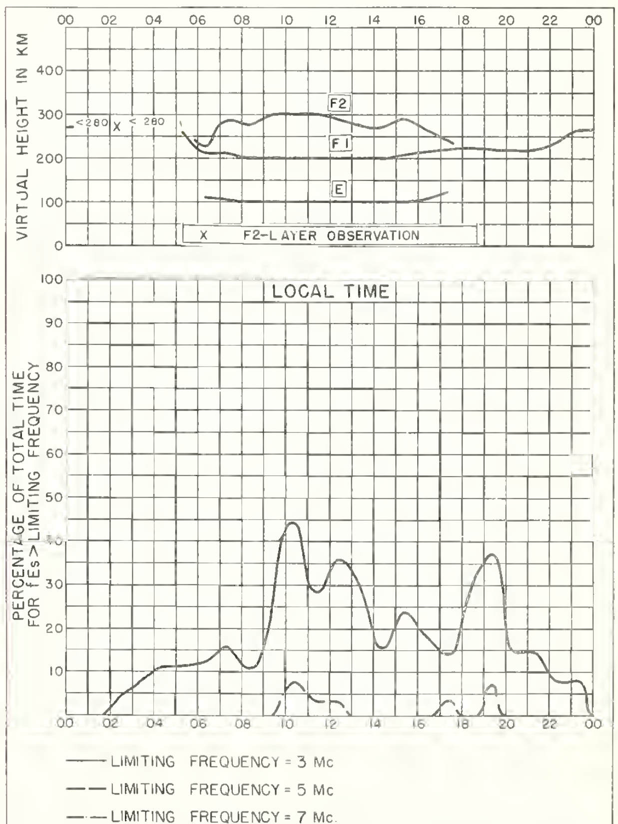


Fig. 36 De BILT, HOLLAND SEPTEMBER 1953

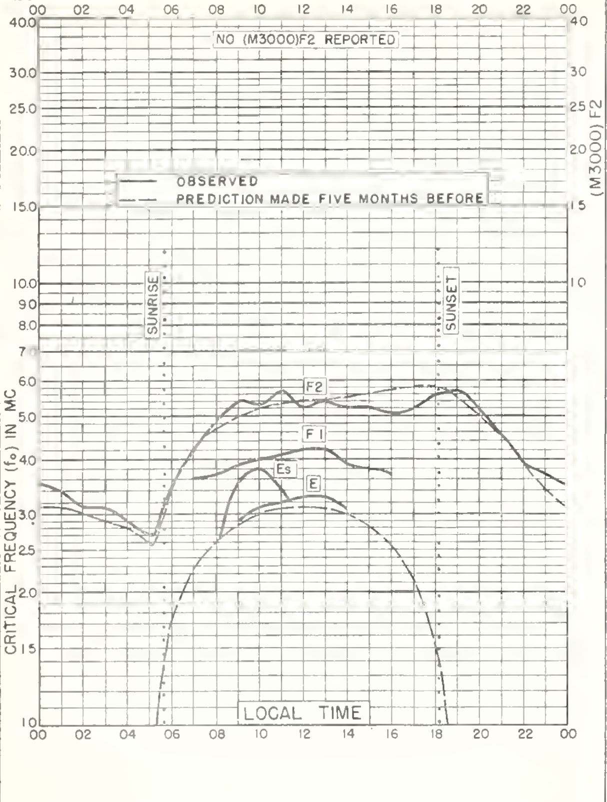


Fig. 37 GRAZ, AUSTRIA
47.1°N, 15.5°E SEPTEMBER 1953

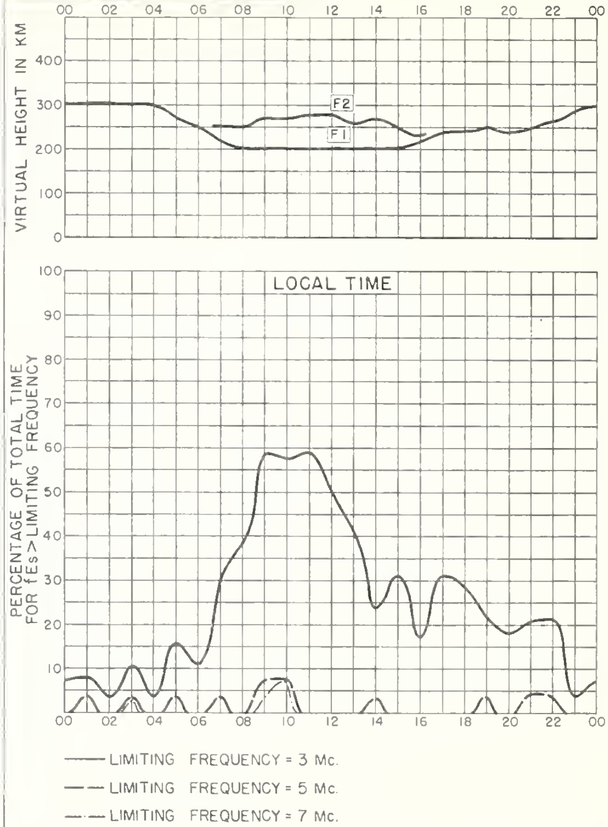


Fig. 38 GRAZ, AUSTRIA SEPTEMBER 1953

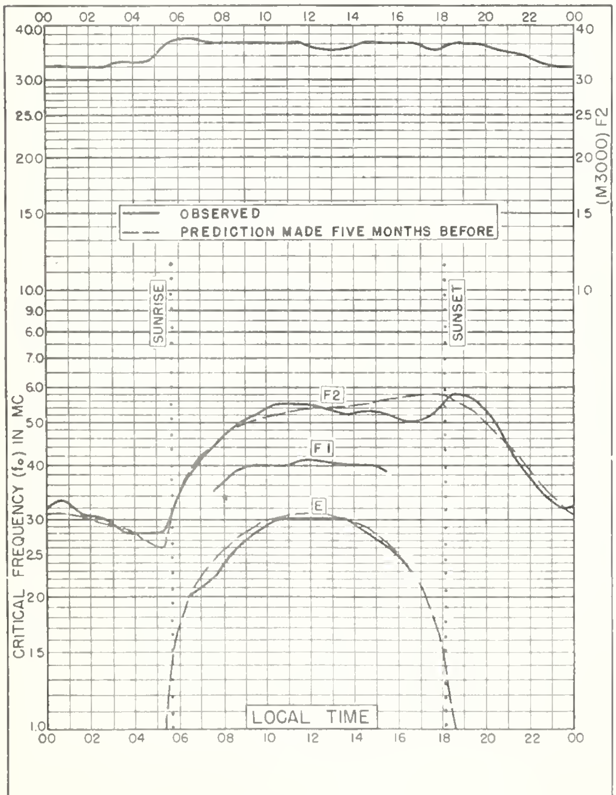
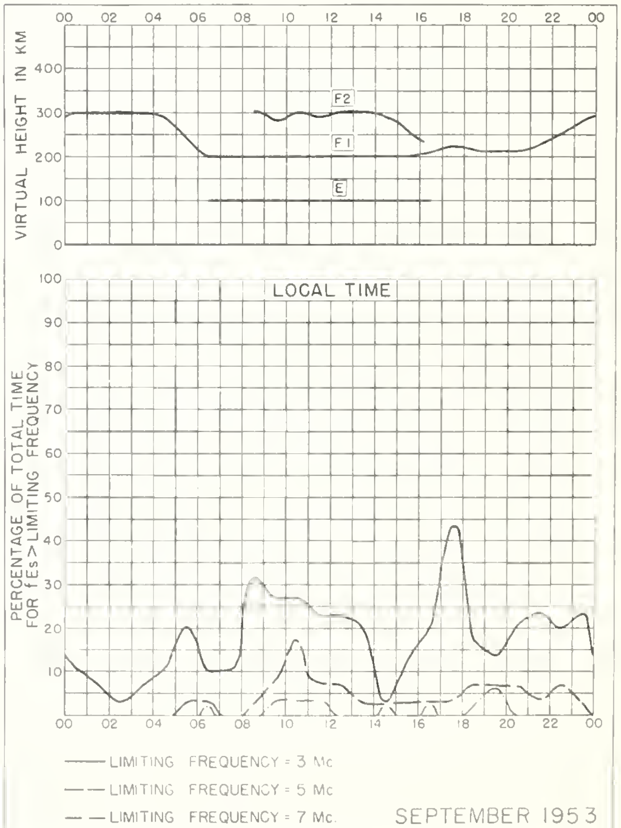


Fig. 39. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E SEPTEMBER 1953



SEPTEMBER 1953
Fig. 40. SCHWARZENBURG, SWITZERLAND

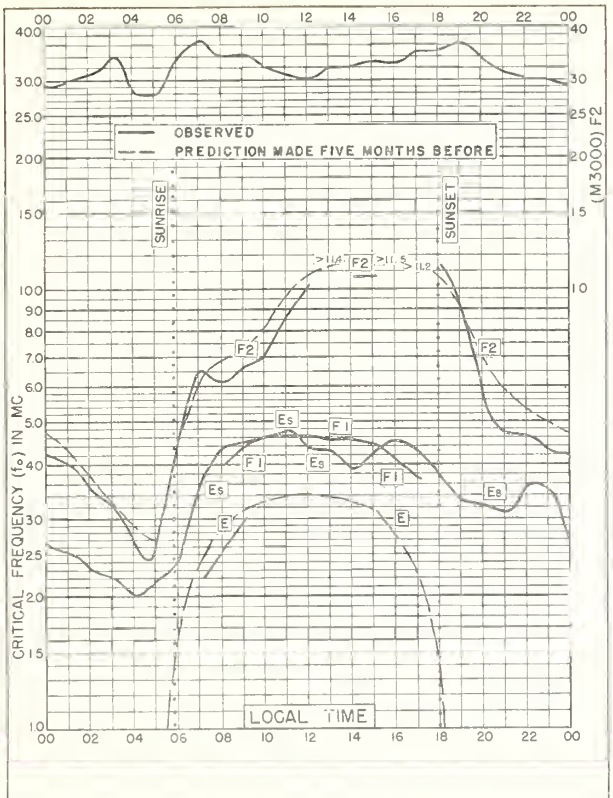


Fig. 41. FORMOSA, CHINA
25.0°N, 121.5°E SEPTEMBER 1953

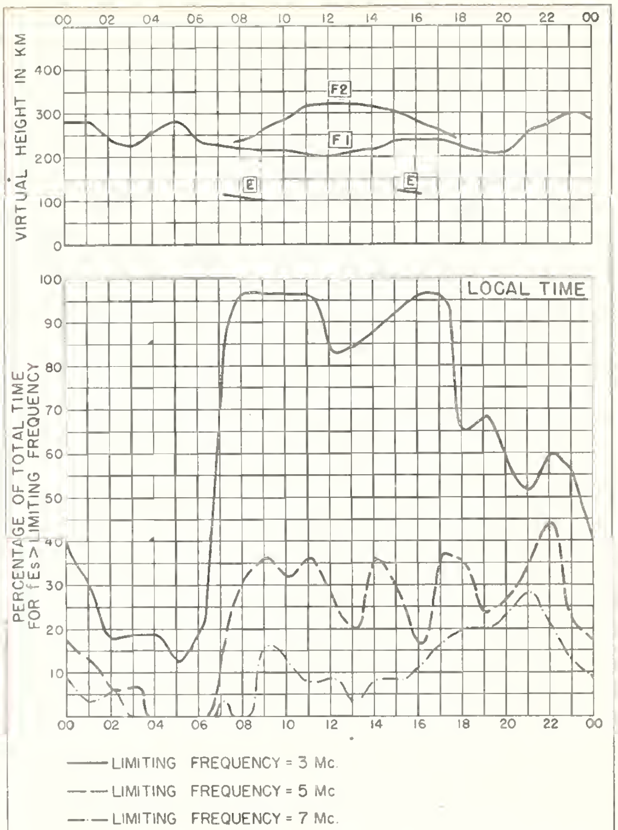


Fig. 42. FORMOSA, CHINA SEPTEMBER 1953

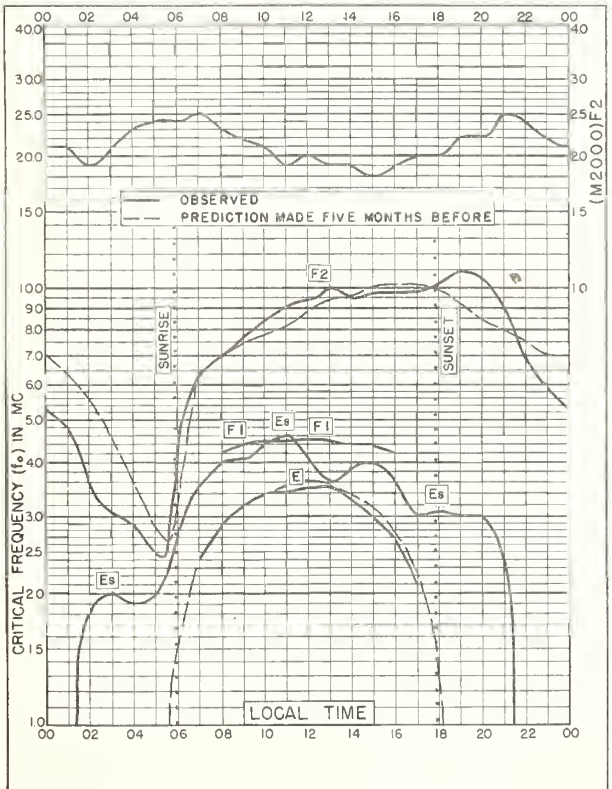
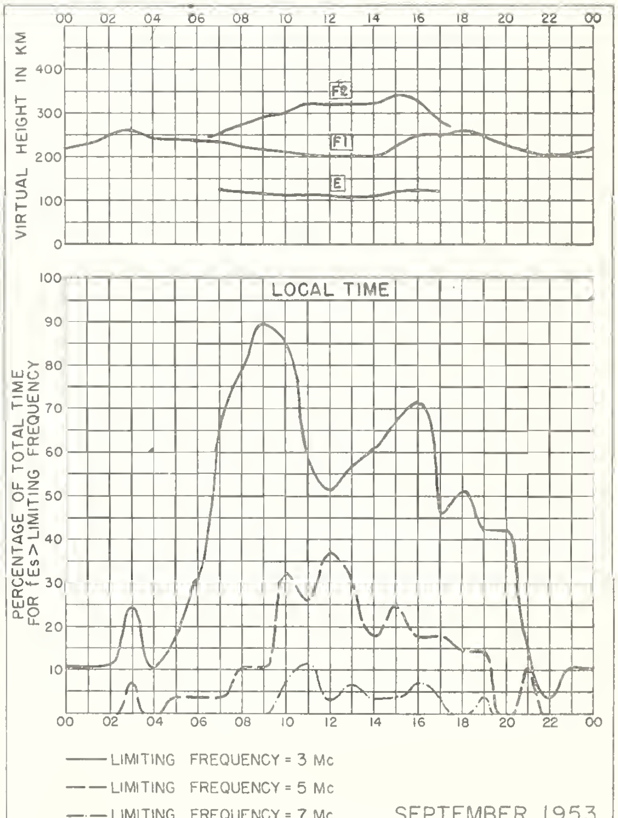


Fig. 43. LEOPOLDVILLE, BELGIAN CONGO
4.3°S, 15.3°E SEPTEMBER 1953



SEPTEMBER 1953
Fig. 44. LEOPOLDVILLE, BELGIAN CONGO

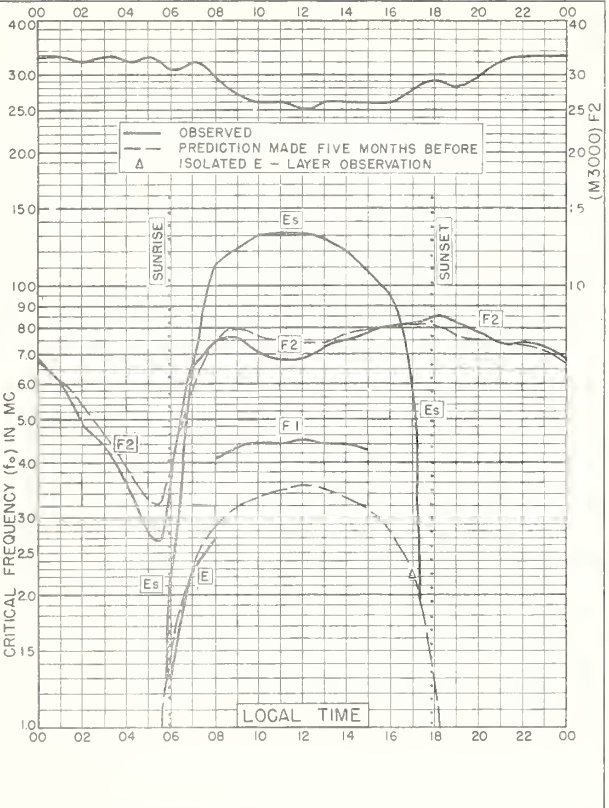


Fig. 45. HUANCAYO, PERU
12.0° S, 75.3° W SEPTEMBER 1953

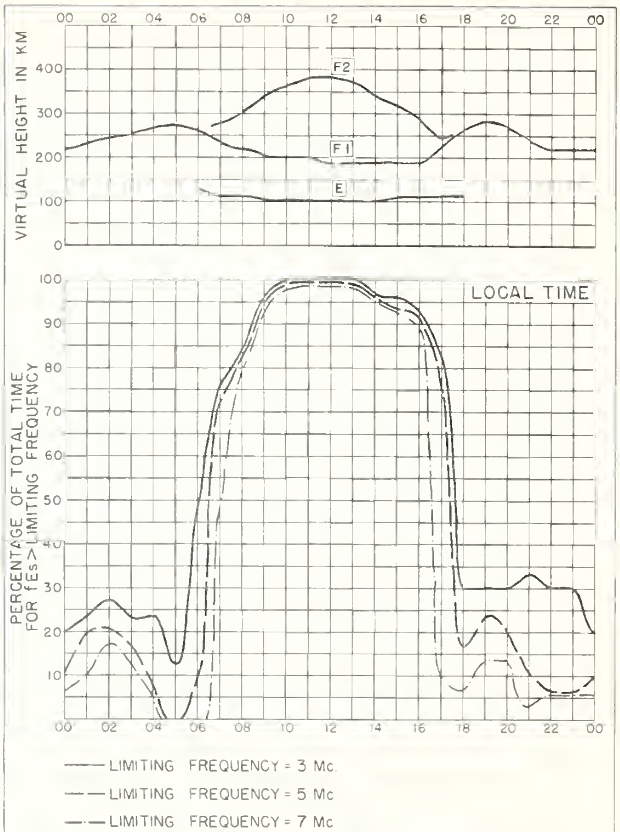


Fig. 46. HUANCAYO, PERU SEPTEMBER 1953

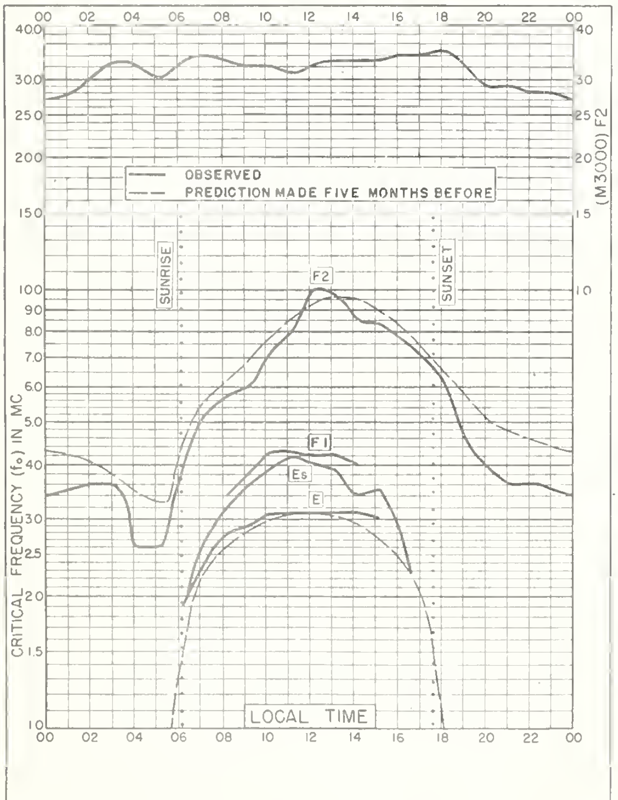


Fig. 47. BUENOS AIRES, ARGENTINA
34.5° S, 58.5° W SEPTEMBER 1953

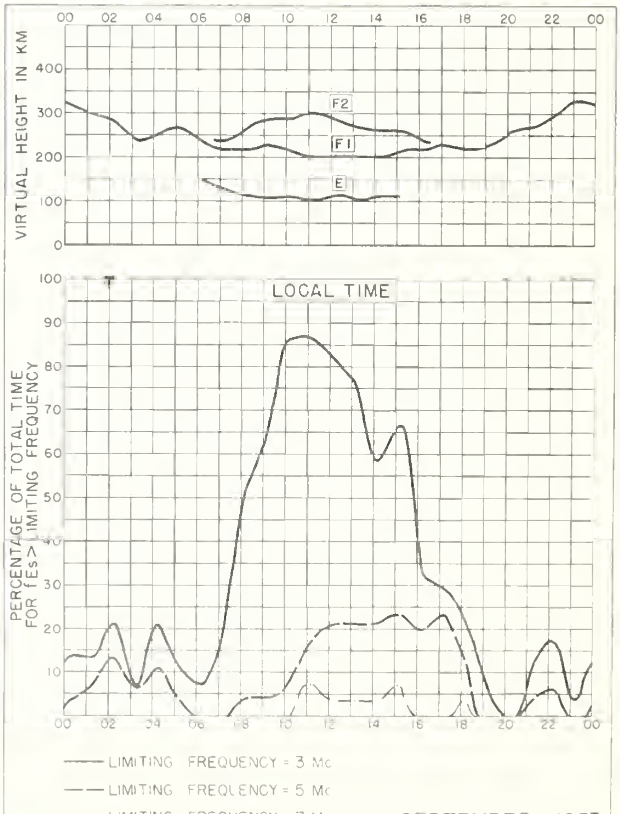


Fig. 48. BUENOS AIRES, ARGENTINA SEPTEMBER 1953

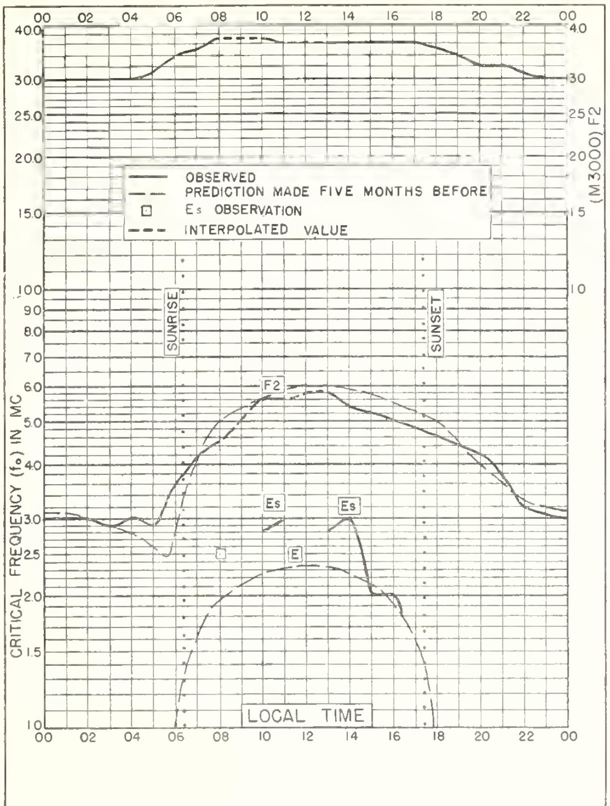


Fig. 49. DECEPCION I.
63.0°S, 60.7°W SEPTEMBER 1953

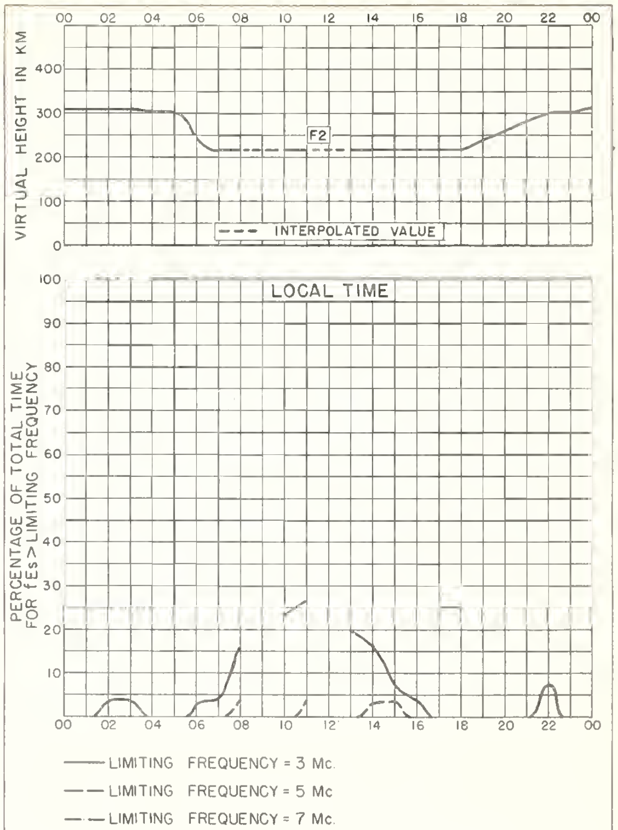


Fig. 50. DECEPCION I. SEPTEMBER 1953

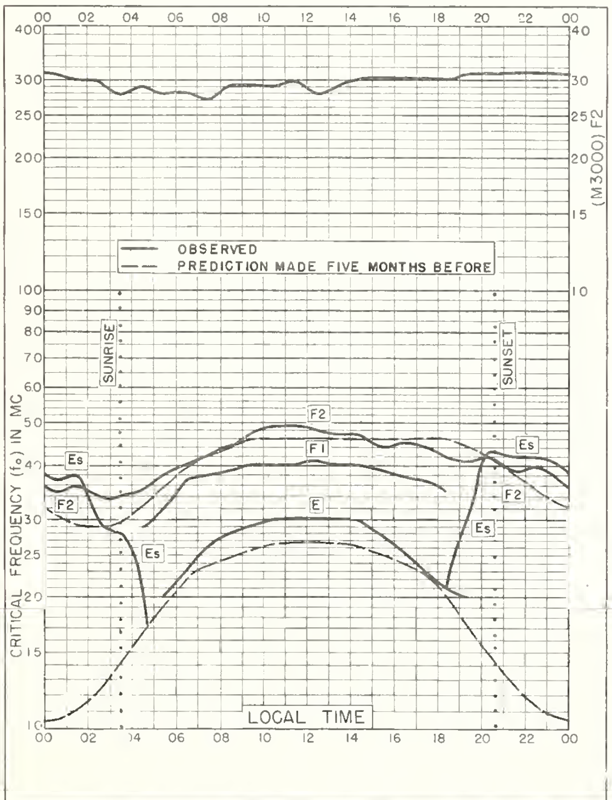


Fig. 51. KIRUNA, SWEDEN
67.8°N, 20.5°E AUGUST 1953

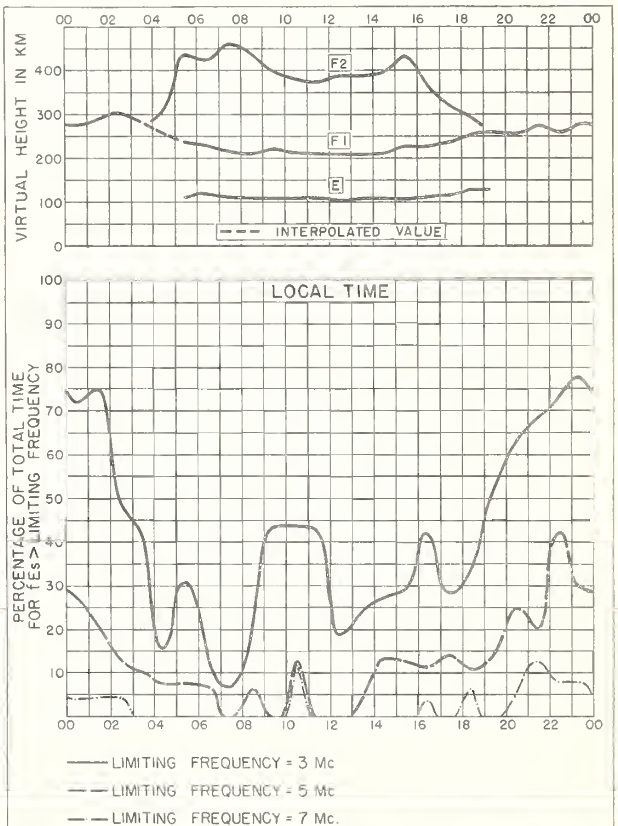


Fig. 52. KIRUNA, SWEDEN AUGUST 1953

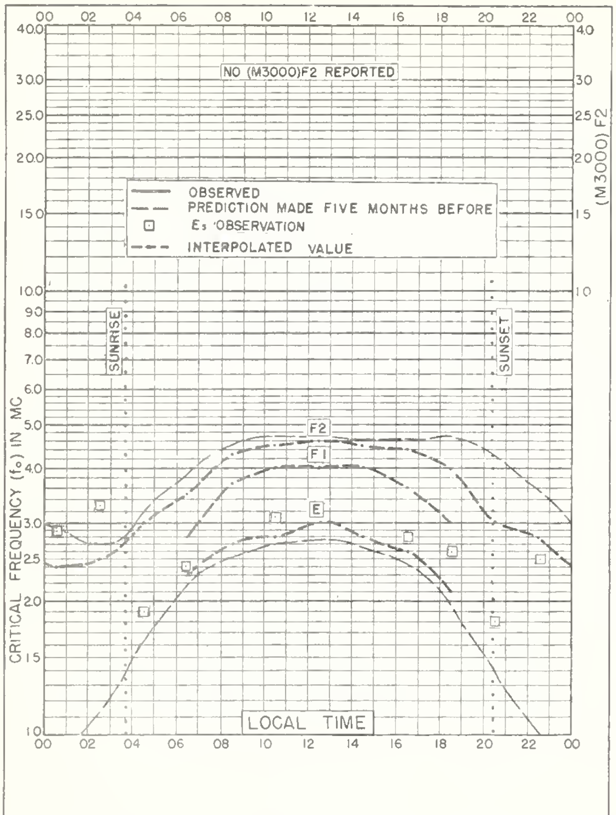


Fig. 53. LULEA, SWEDEN
65.6°N, 22.1°E AUGUST 1953

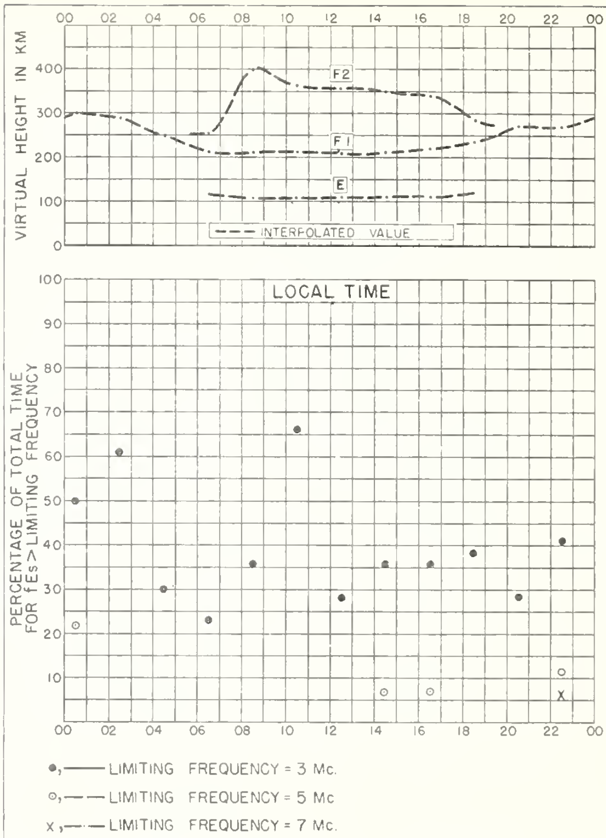


Fig. 54. LULEA, SWEDEN AUGUST 1953

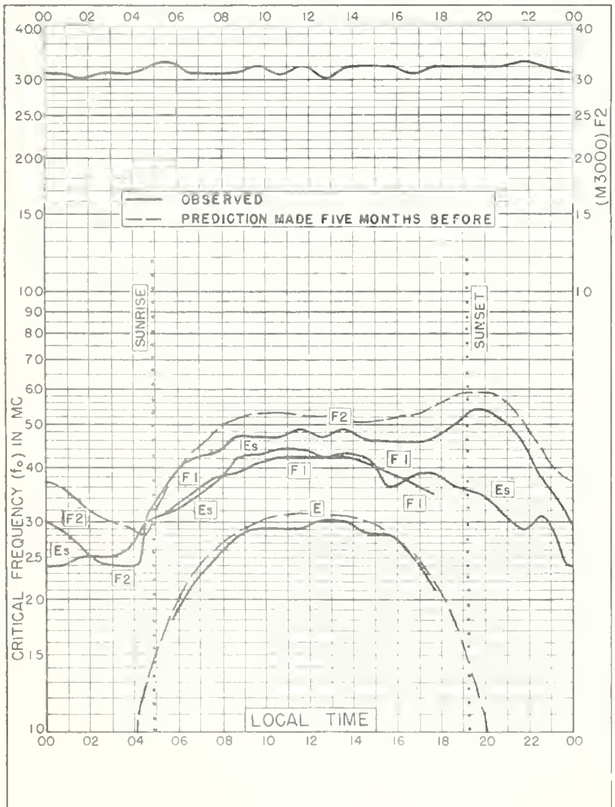


Fig. 55. LINDAU / HARZ, GERMANY
51.6°N, 10.1°E AUGUST 1953

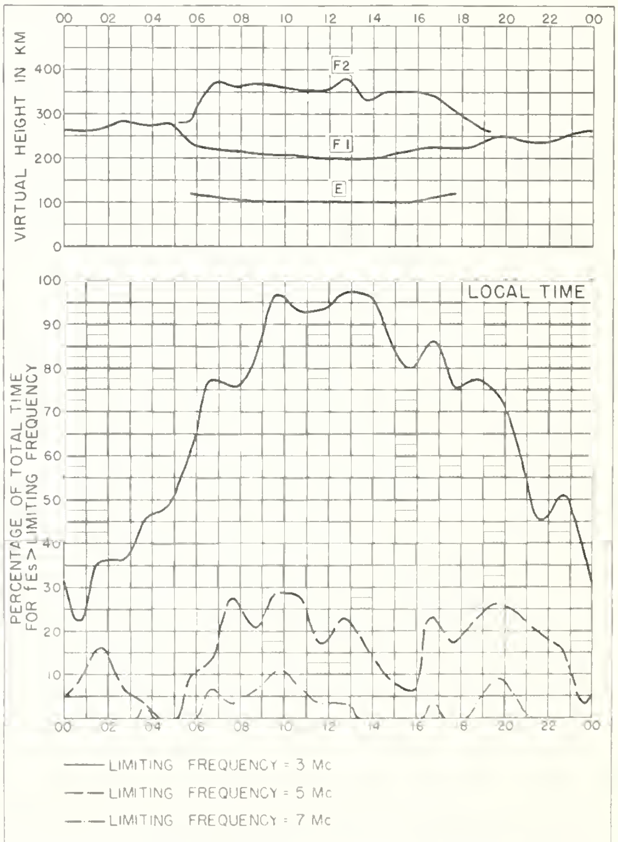


Fig. 56. LINDAU / HARZ, GERMANY AUGUST 1953

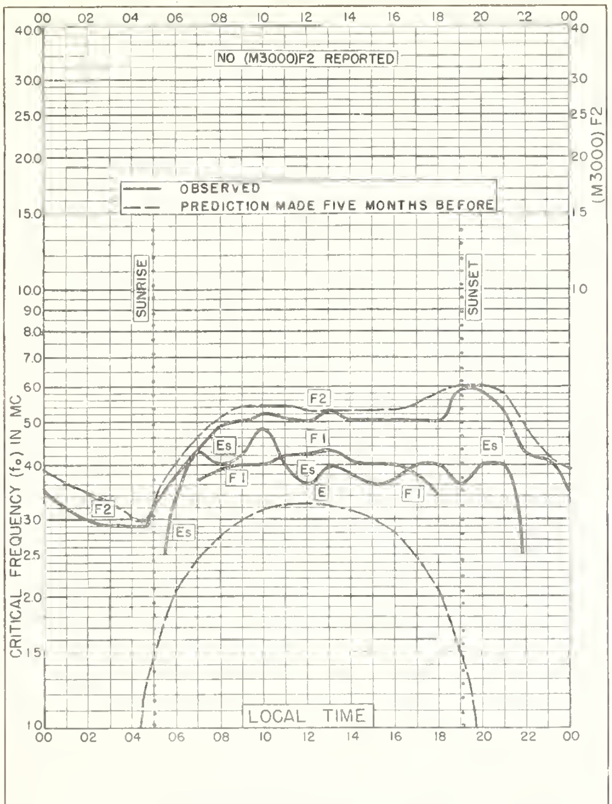


Fig. 57 GRAZ, AUSTRIA
47.1° N, 15.5° E AUGUST 1953

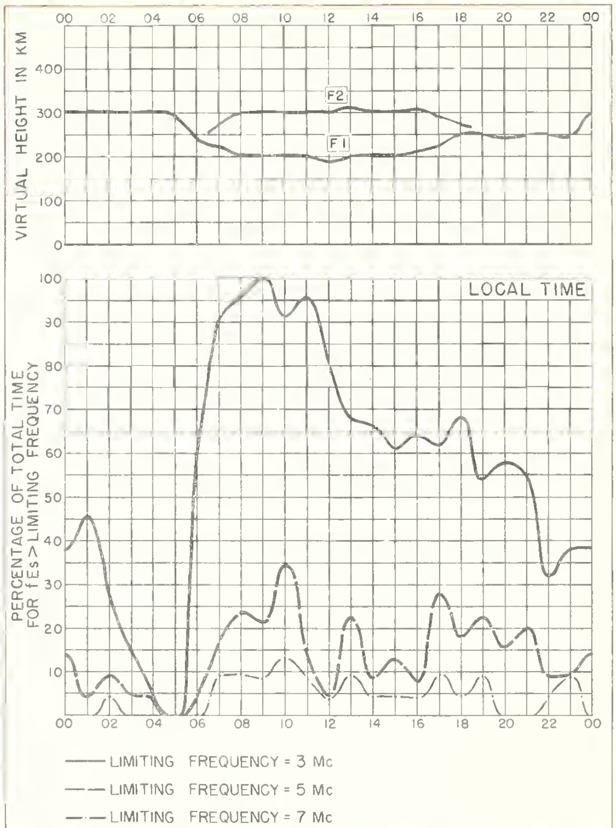


Fig 58 GRAZ, AUSTRIA AUGUST 1953

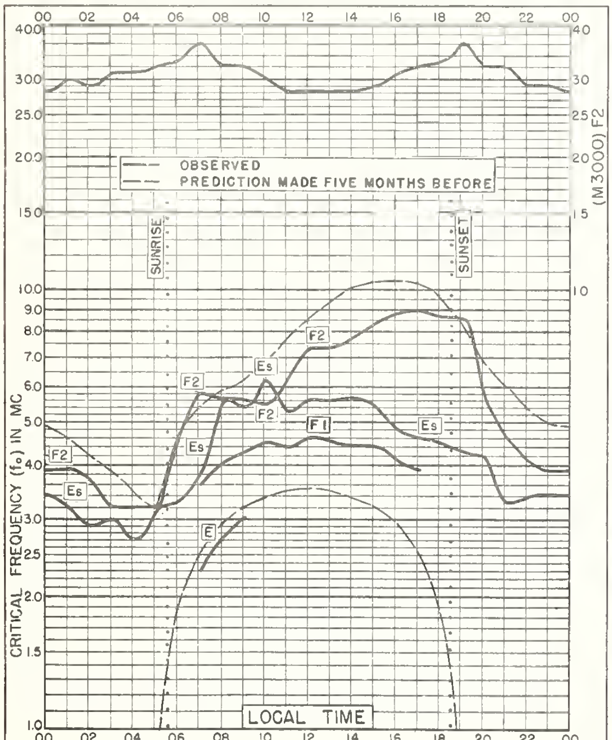


Fig. 59. FORMOSA, CHINA
25.0°N, 121.5° E AUGUST 1953

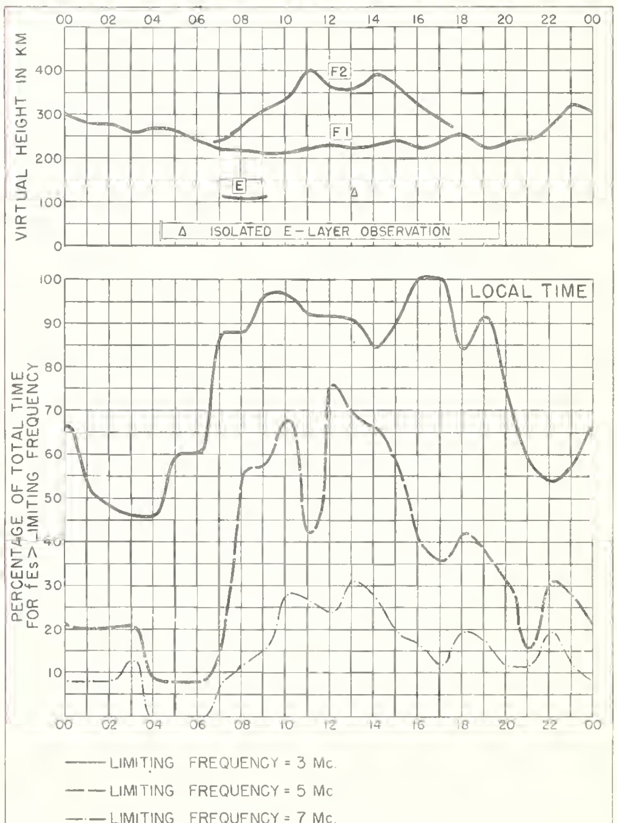


Fig. 60. FORMOSA, CHINA AUGUST 1953

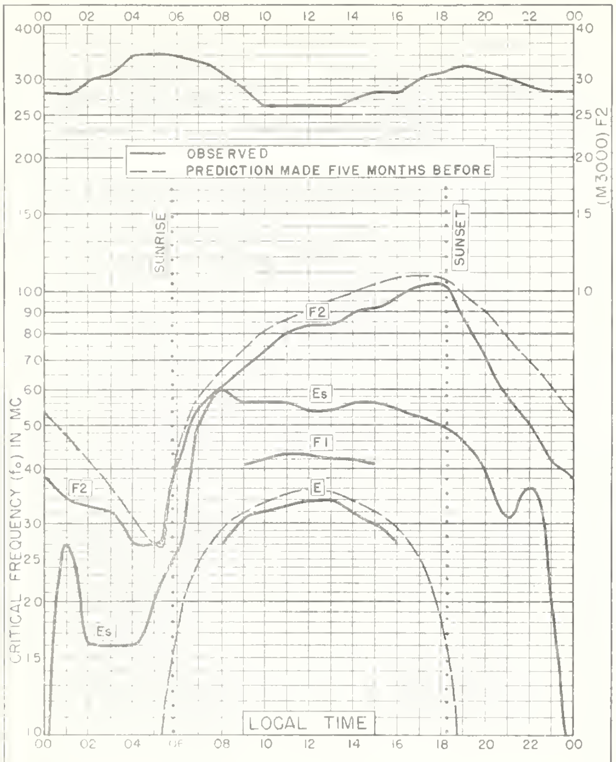


Fig 61 BAGUIO, P. I.
16.4°N, 120.6°E AUGUST 1953

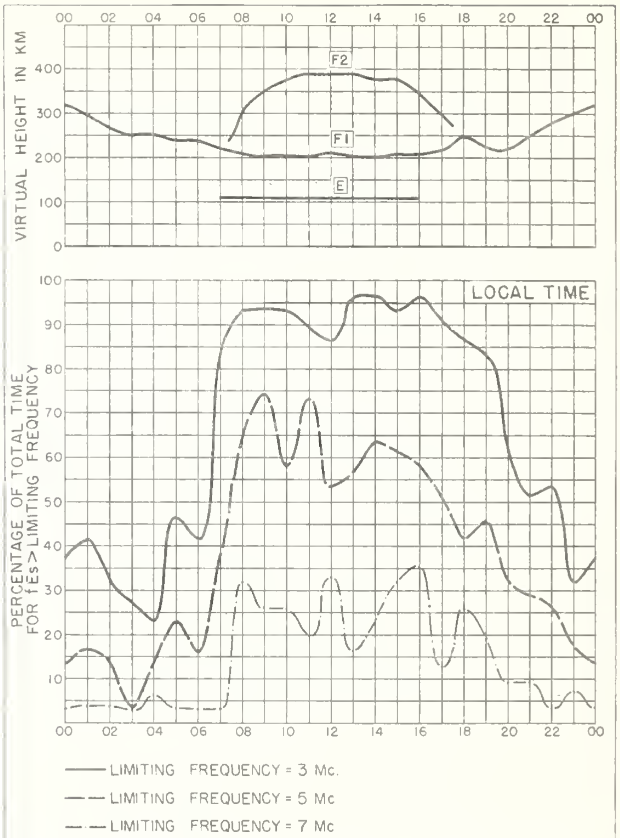


Fig. 62 BAGUIO, P. I AUGUST 1953

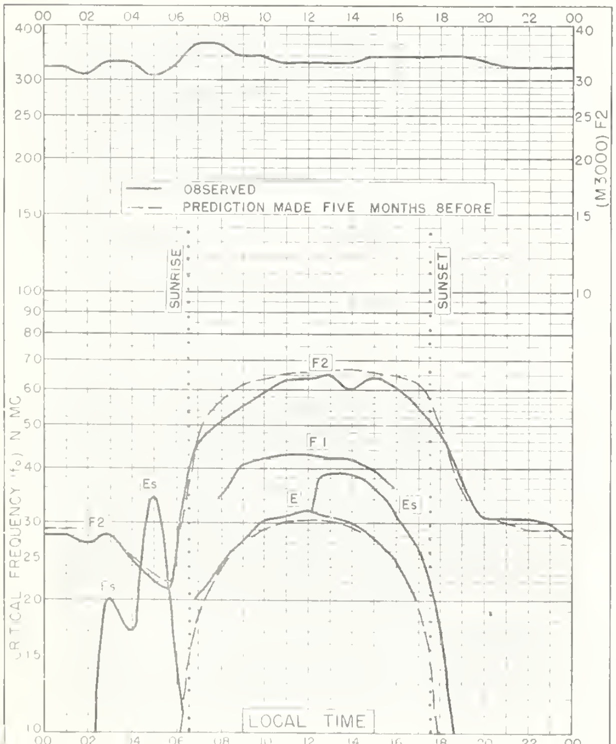
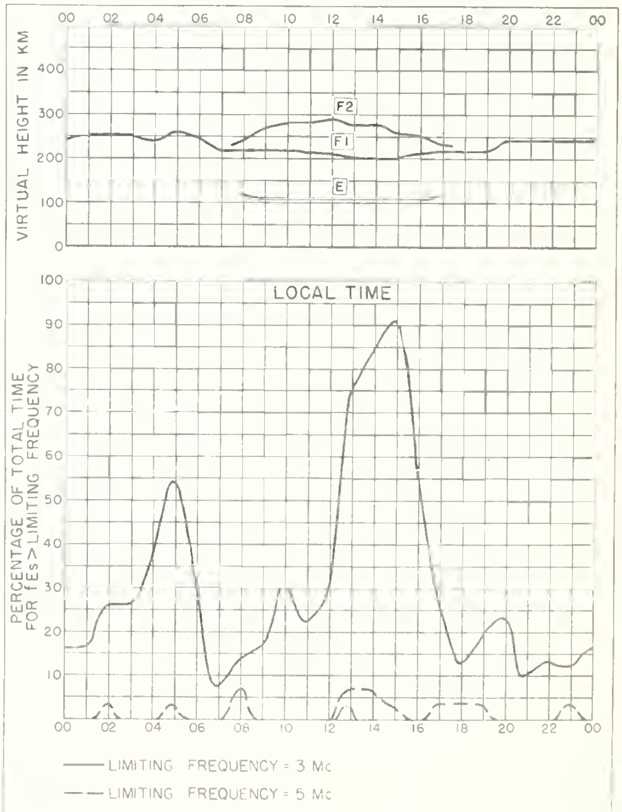


Fig 63 JOHANNESBURG, U. OF S. AFRICA
26.2° S, 28.1°E AUGUST 1953



AUGUST 1953
Fig. 64 JOHANNESBURG, U. OF S. AFRICA

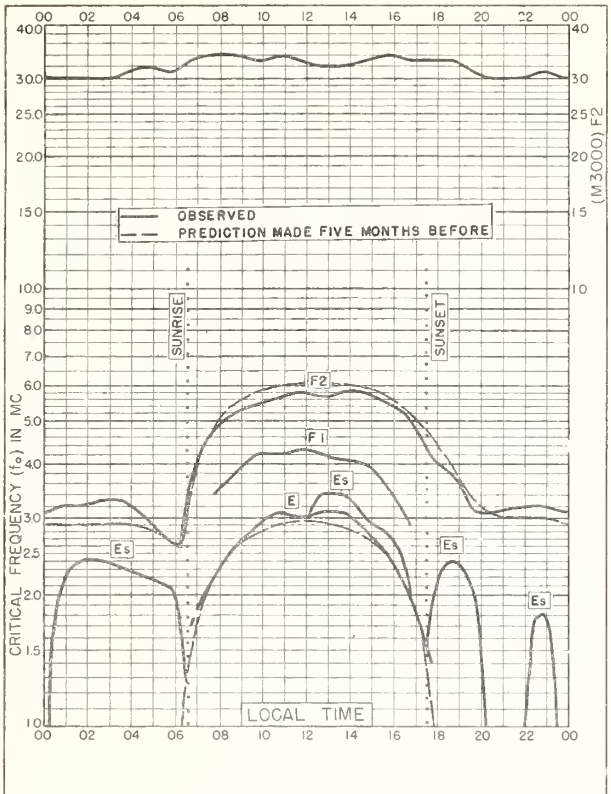


Fig. 65 WATHEROO, W. AUSTRALIA
30.3° S, 115.9° E AUGUST 1953

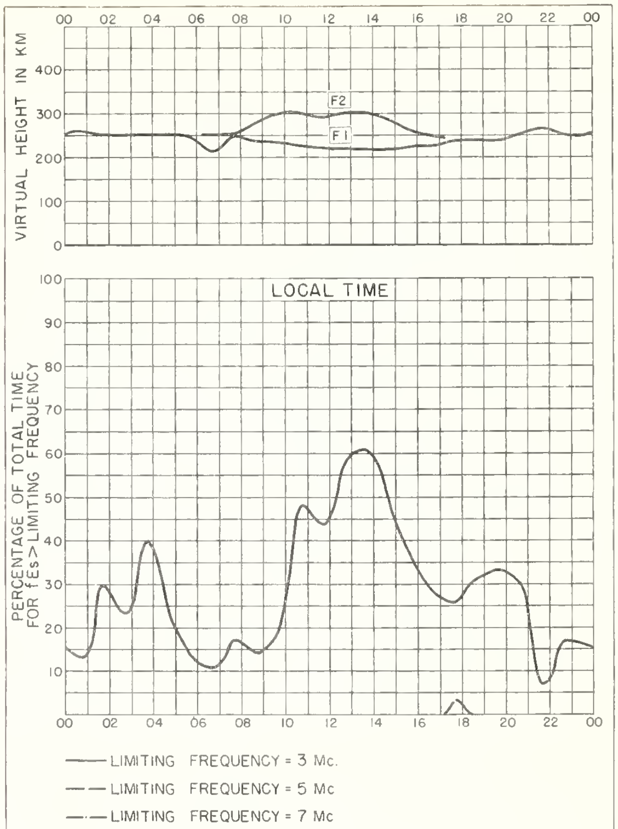


Fig. 66 WATHEROO, W AUSTRALIA AUGUST 1953

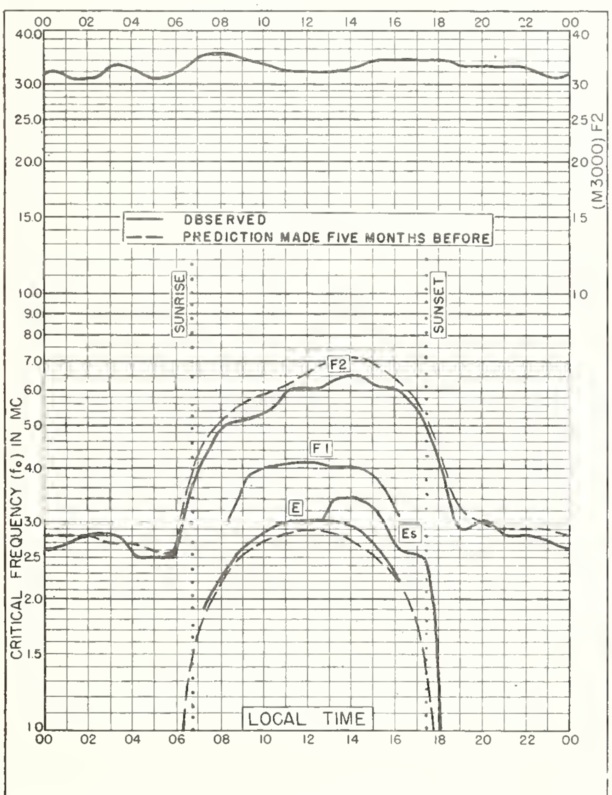


Fig. 67 CAPETOWN, U. OF S. AFRICA
34.2° S, 18.3° E AUGUST 1953

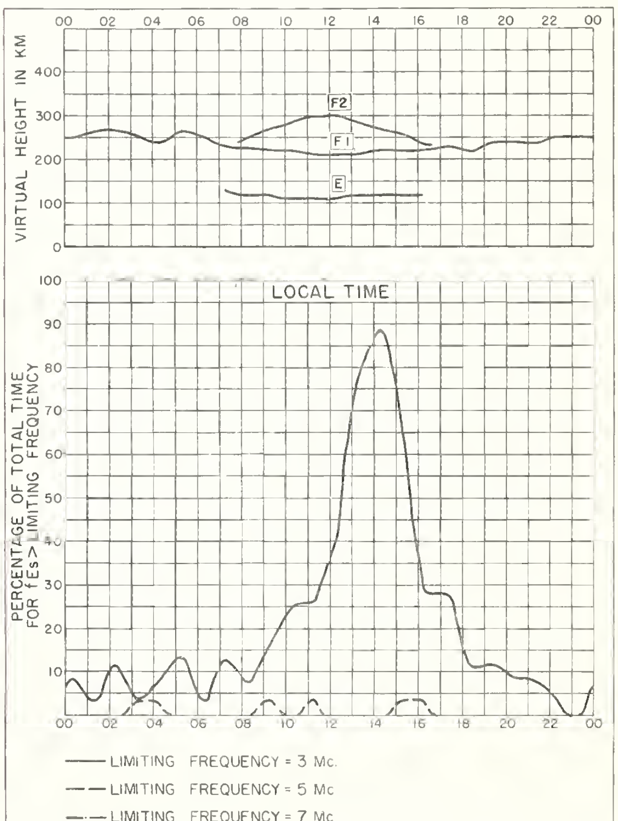


Fig 68. CAPETOWN, U. OF S. AFRICA AUGUST 1953

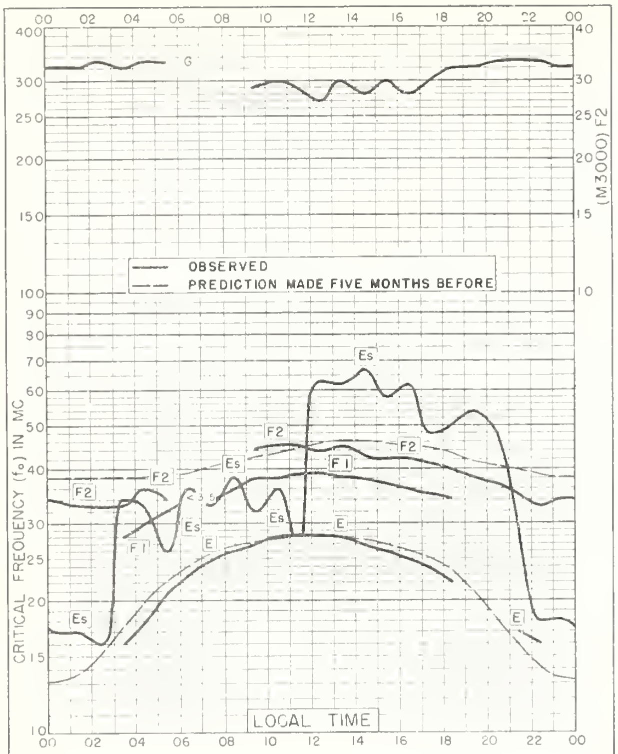


Fig. 69 GODHAVN, GREENLAND
69.2°N, 53.5°W JULY 1953

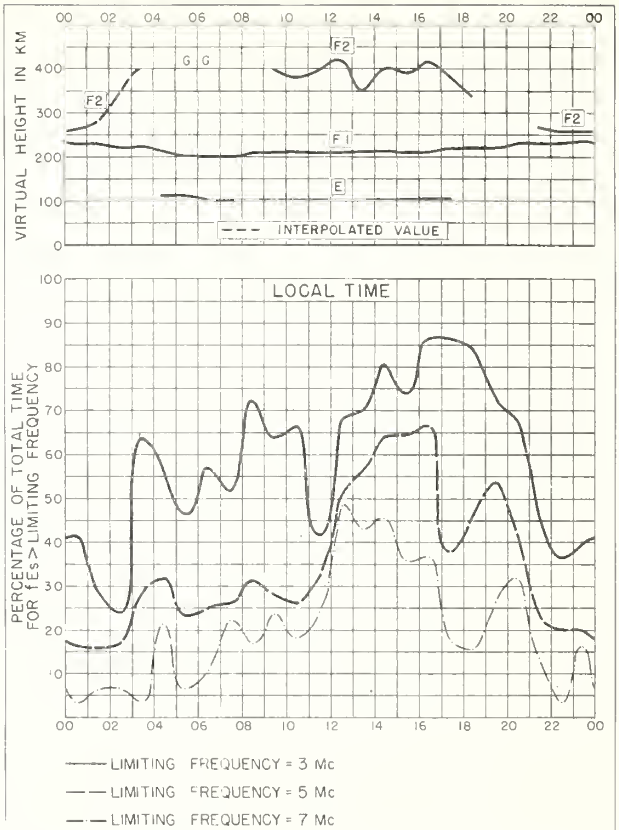


Fig. 70. GODHAVN, GREENLAND JULY 1953

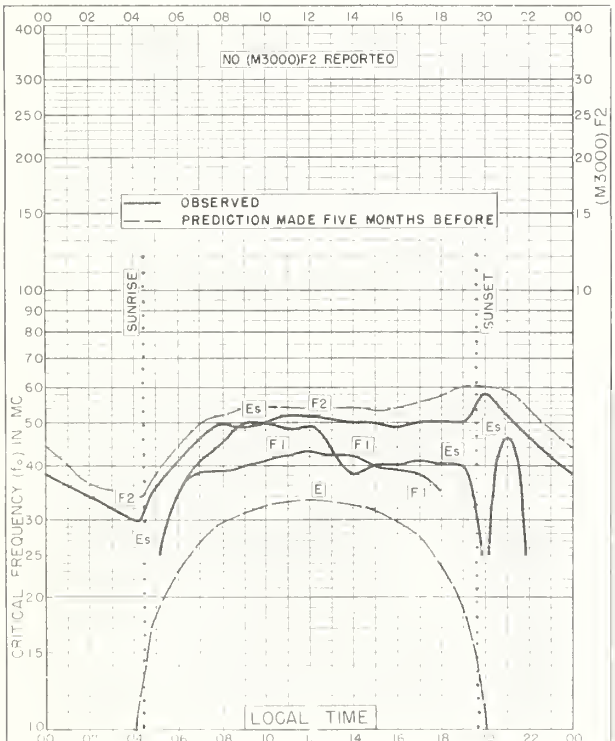


Fig 71 GRAZ, AUSTRIA
47.1°N, 15.5°E JULY 1953

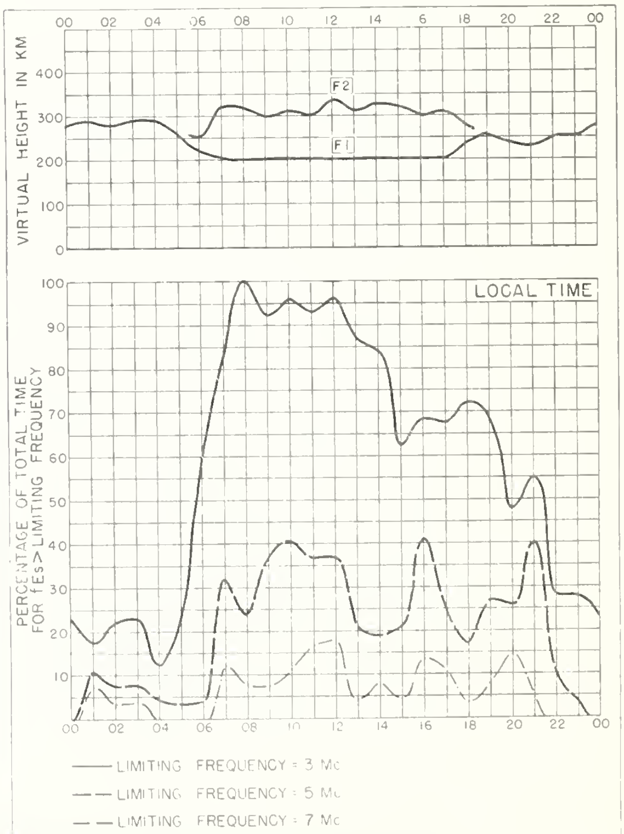
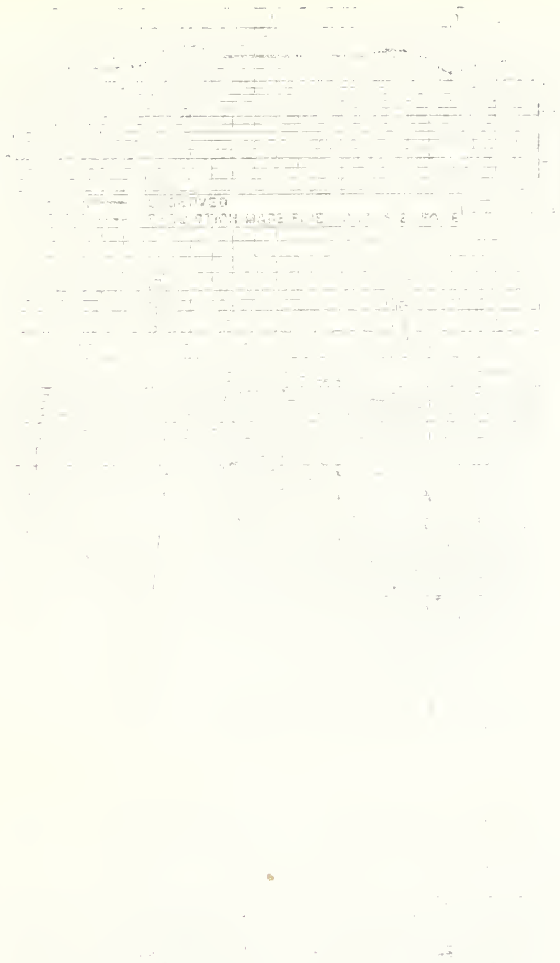
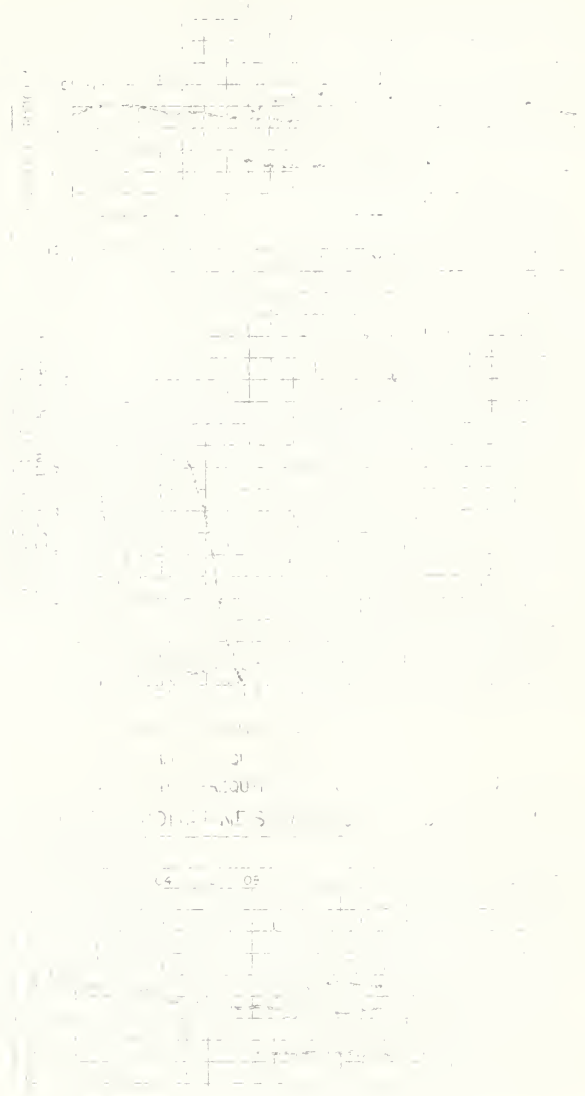


Fig 72. GRAZ, AUSTRIA JULY 1953





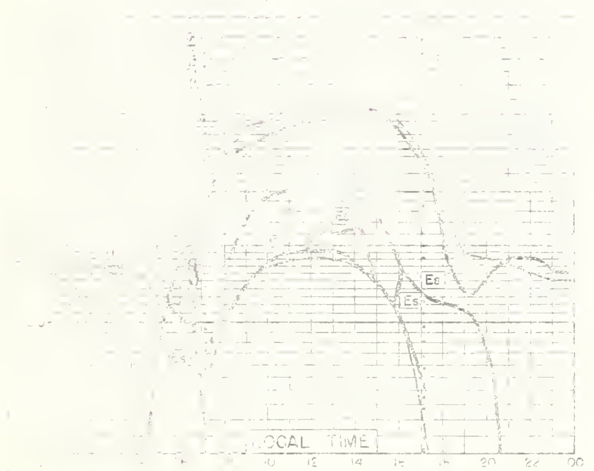
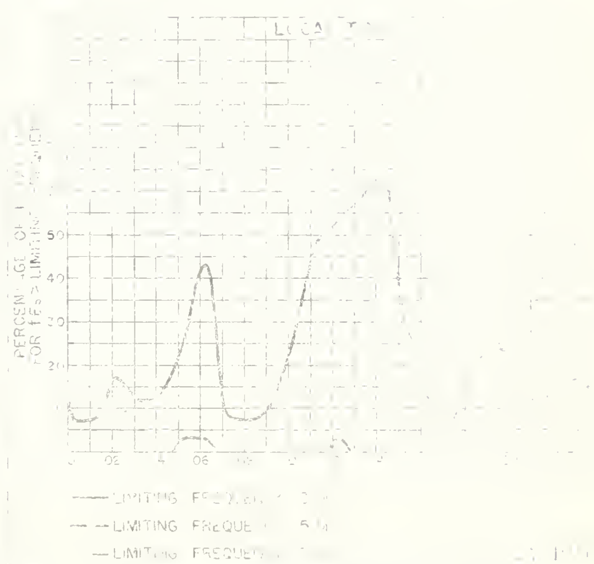


Fig. CAPETOWN, UNION OF S. AFRICA
34.2°S, 18.3°E JULY 1955



CAPETOWN, UNION OF S.

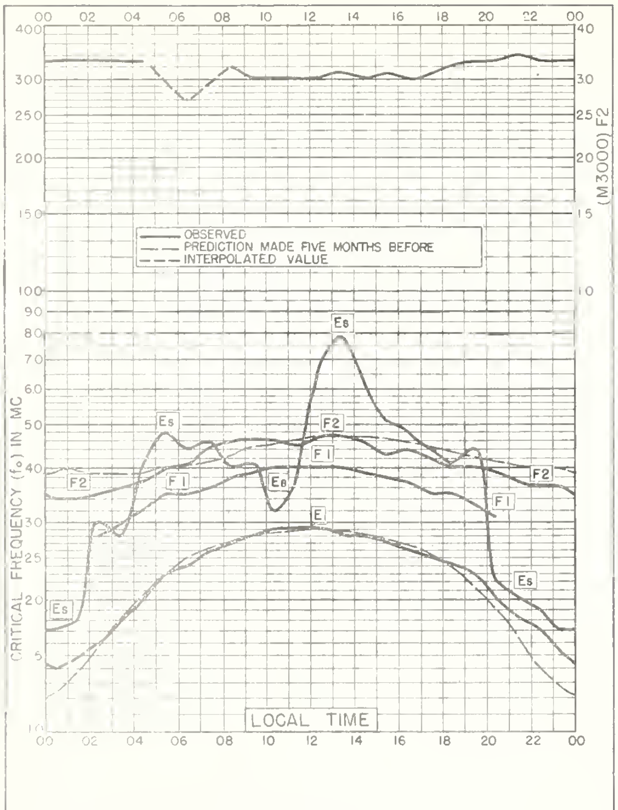


Fig. 77 GODHAVN, GREENLAND
69.2°N, 53.5°W JUNE 1953

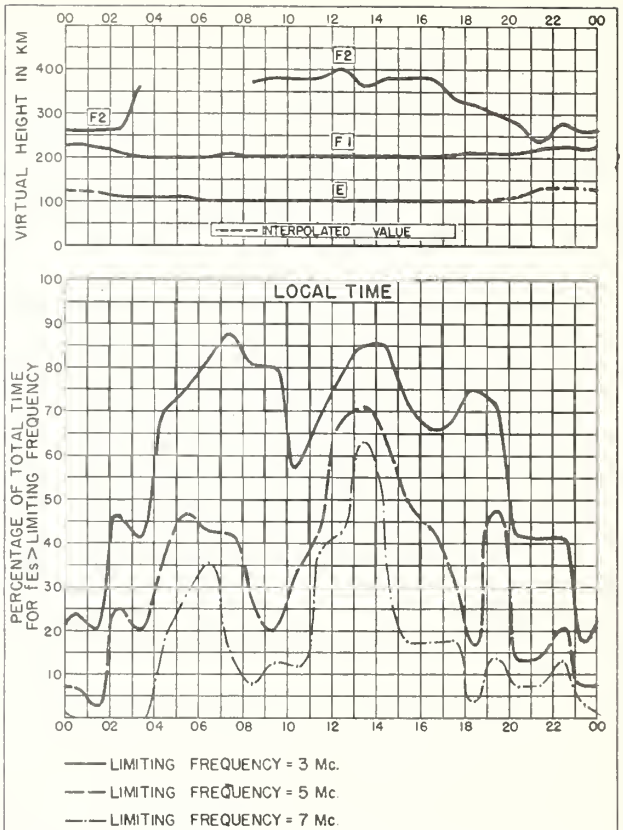


Fig. 78 GODHAVN, GREENLAND JUNE 1953

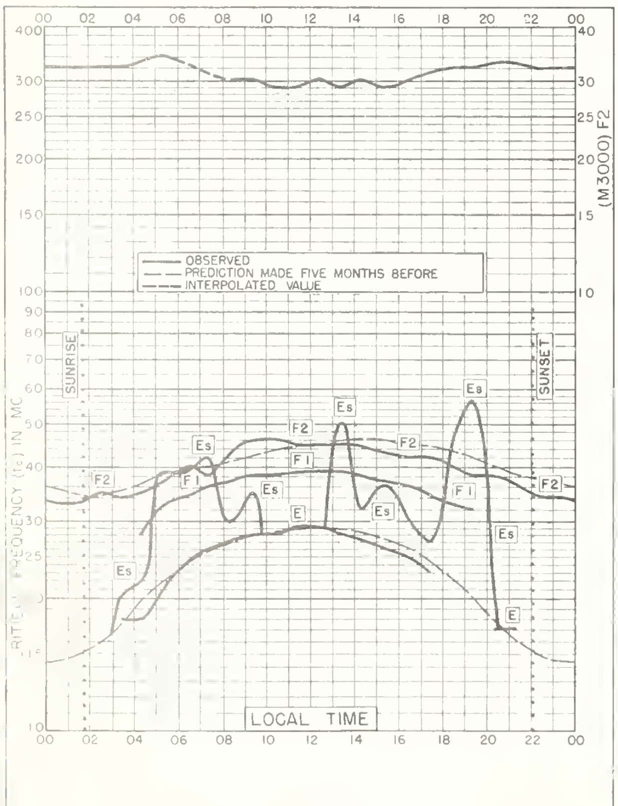


Fig. 79 GODHAVN, GREENLAND
69.2°N, 53.5°W MAY 1953

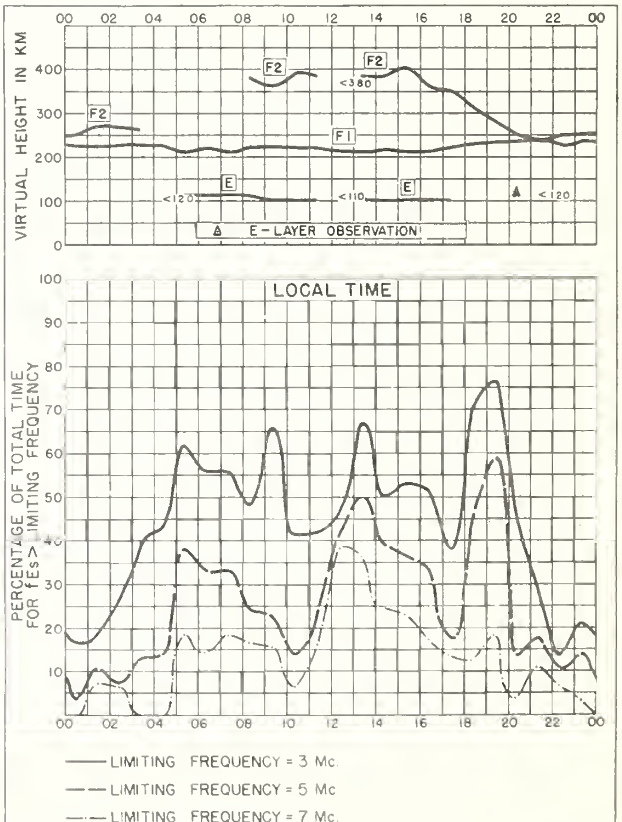


Fig. 80 GODHAVN, GREENLAND MAY 1953

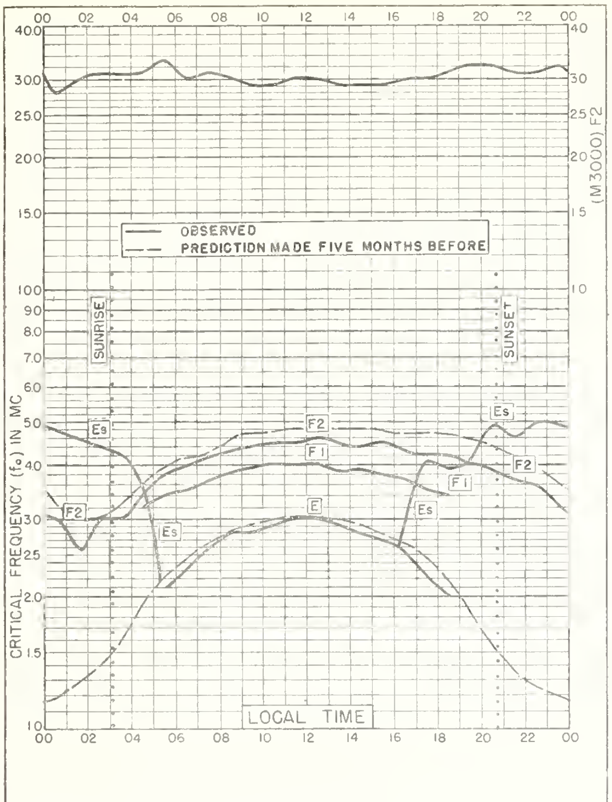


Fig. 81 REYKJAVIK, ICELAND
64.1° N, 21.8° W MAY 1953

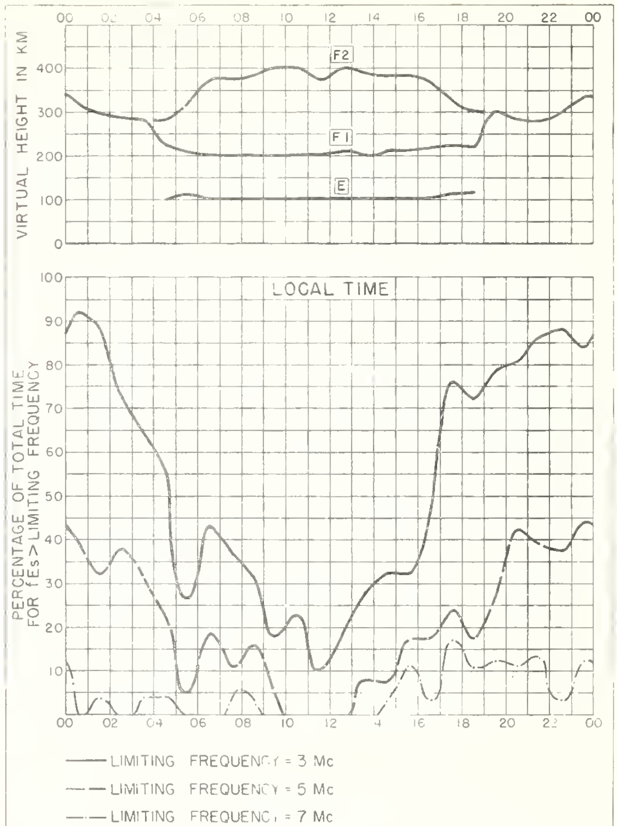


Fig. 82 REYKJAVIK, ICELAND MAY 1953

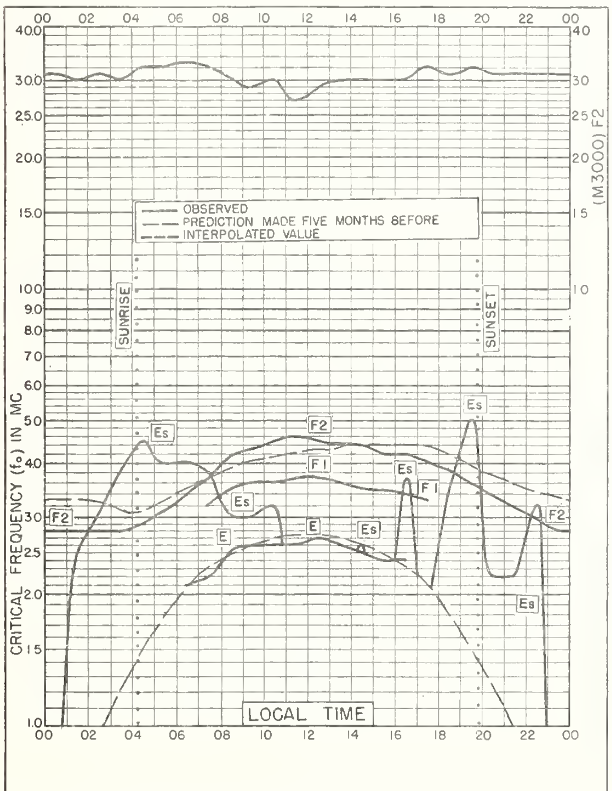


Fig. 83 GODHAVN, GREENLAND
69.2° N, 53.5° W APRIL 1953

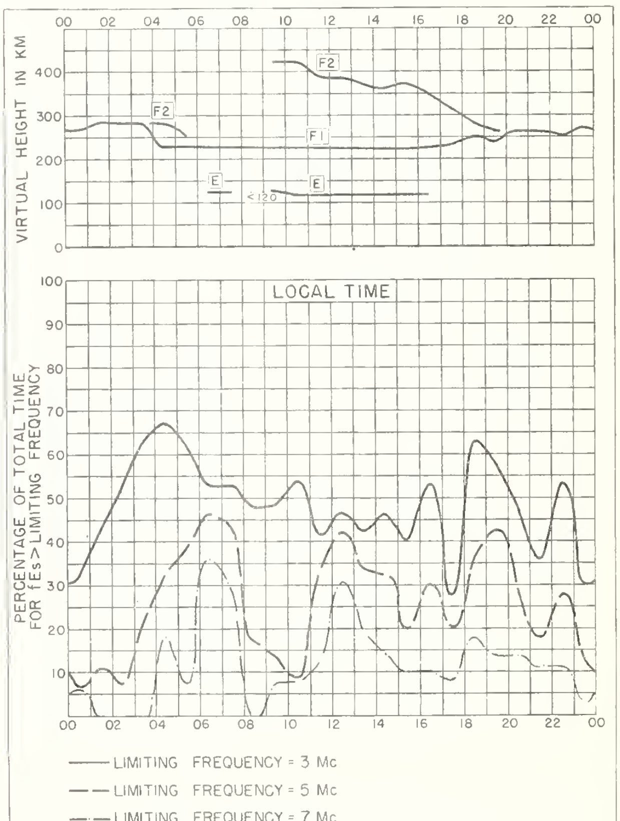


Fig. 84 GODHAVN, GREENLAND APRIL 1953

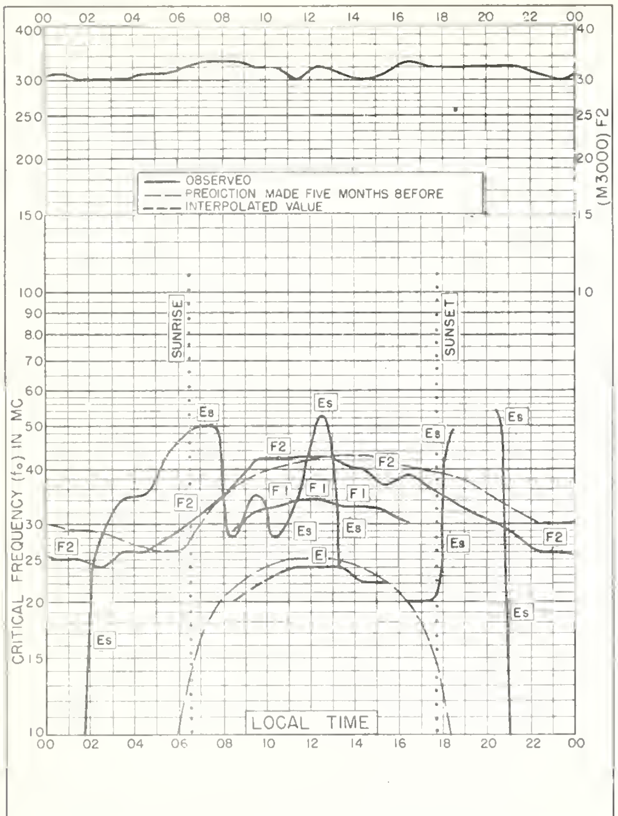


Fig. 85 GODHAVN, GREENLAND
69.2° N, 53.5° W MARCH 1953

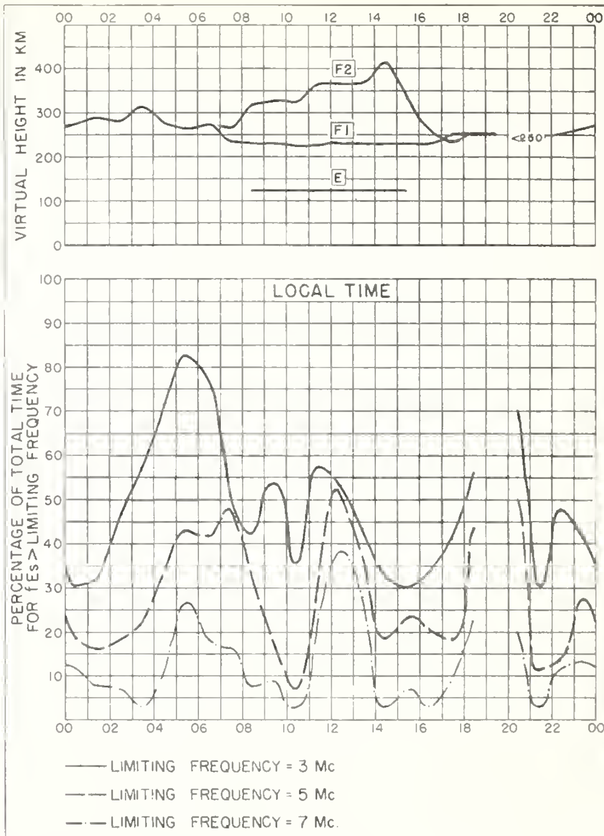


Fig. 86 GODHAVN, GREENLAND MARCH 1953

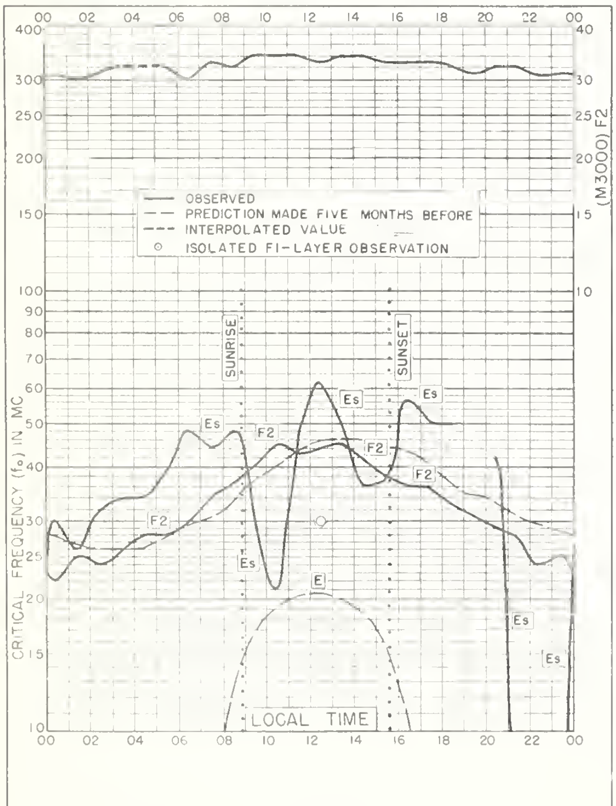


Fig. 87 GODHAVN, GREENLAND
69.2° N, 53.5° W FEBRUARY 1953

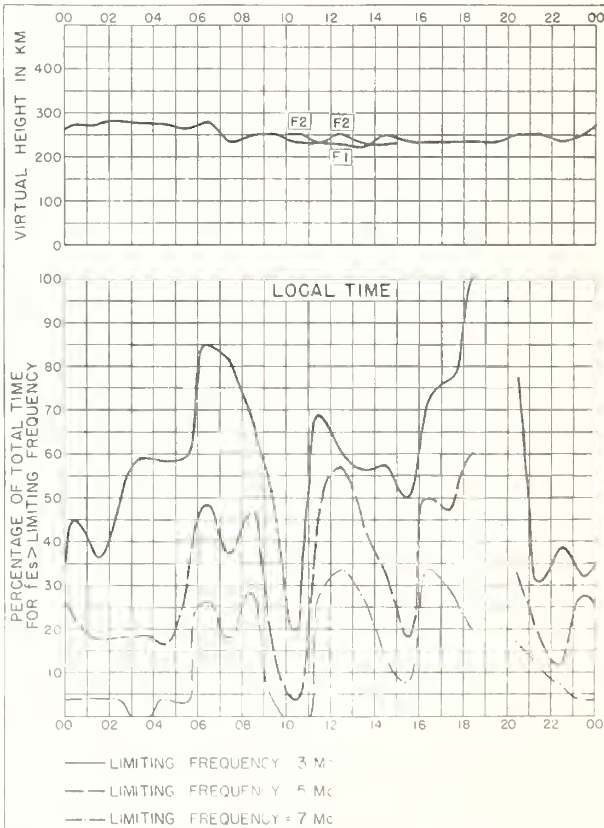


Fig 88 GODHAVN, GREENLAND FEBRUARY 1953

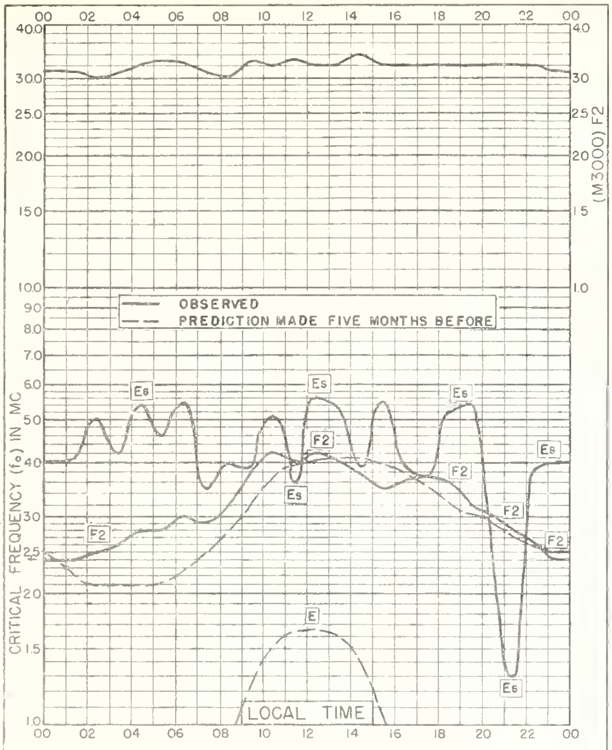


Fig. 89 GODHAVN, GREENLAND
69.2° N, 53.5° W JANUARY 1953

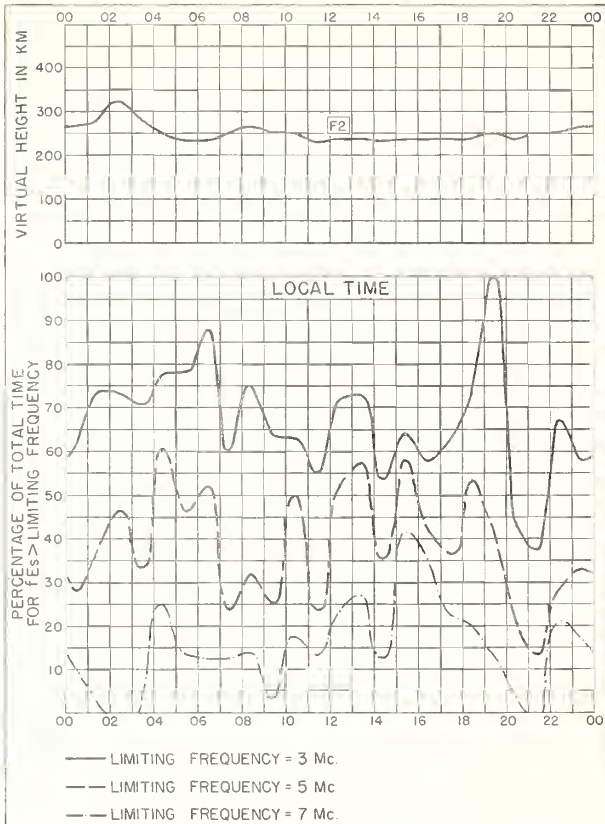


Fig. 90 GODHAVN, GREENLAND JANUARY 1953

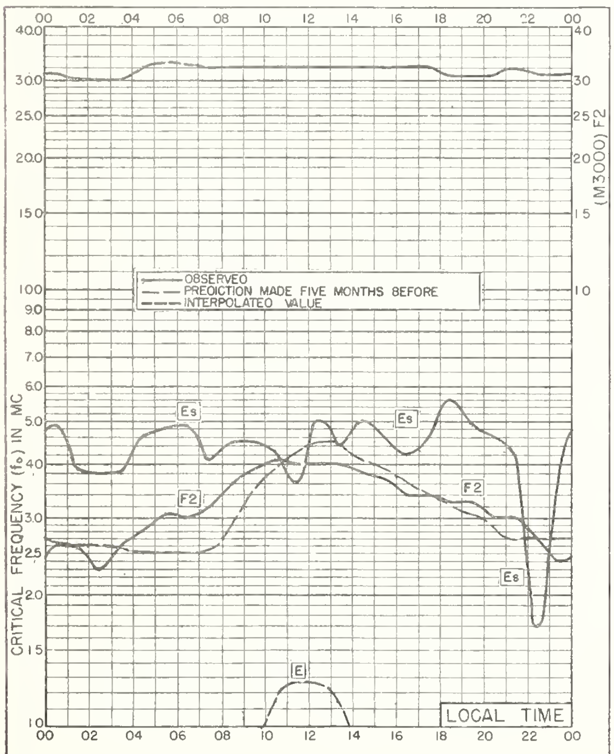


Fig. 91 GODHAVN, GREENLAND
69.2° N, 53.5° W DECEMBER 1952

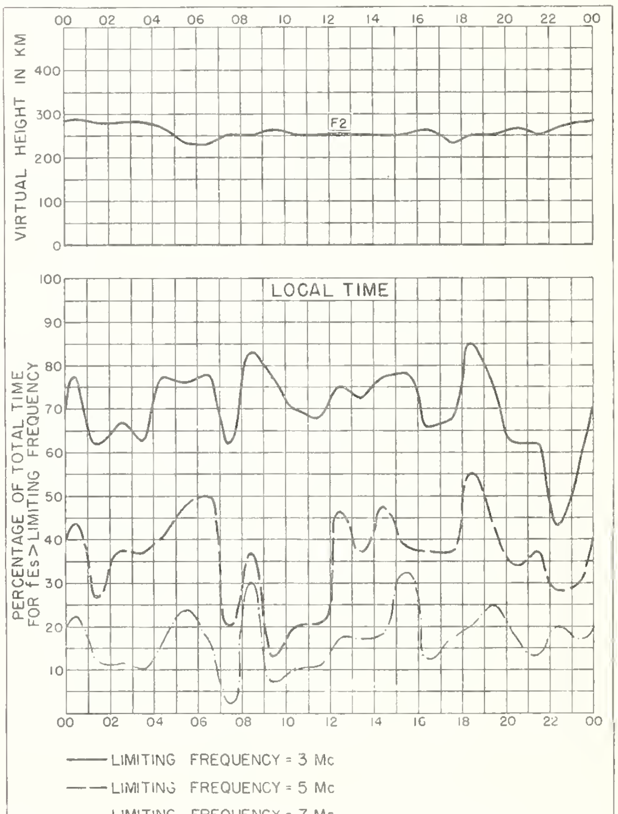


Fig. 92 GODHAVN, GREENLAND DECEMBER 1952

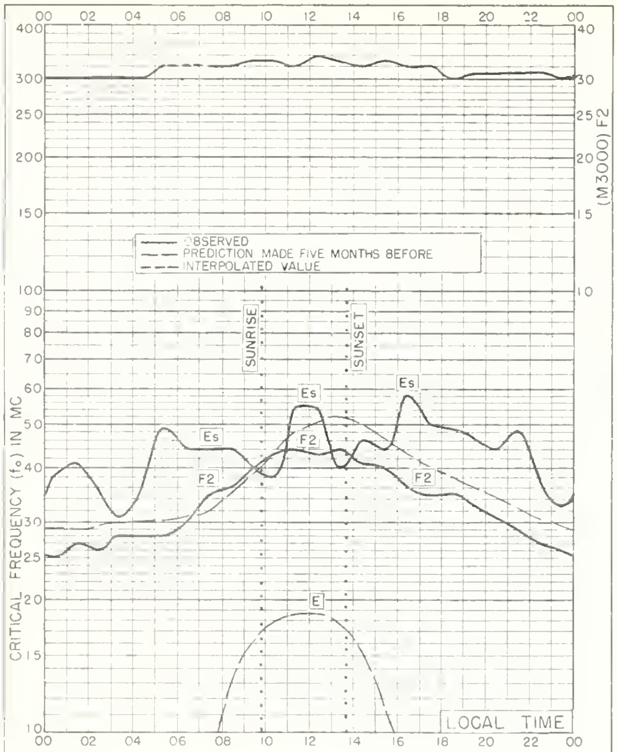


Fig 93 GODHAVN, GREENLAND
69.2°N, 53.5°W NOVEMBER 1952

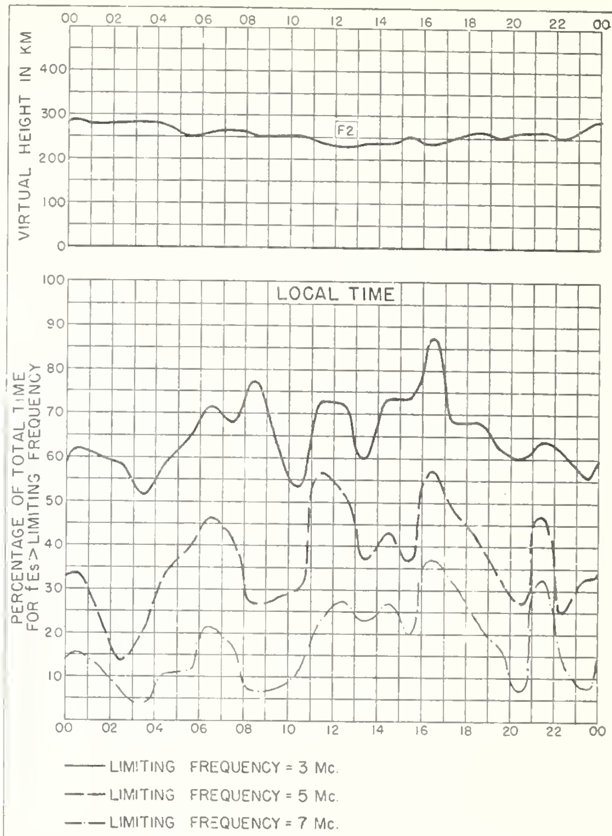


Fig. 94 GODHAVN, GREENLAND NOVEMBER 1952

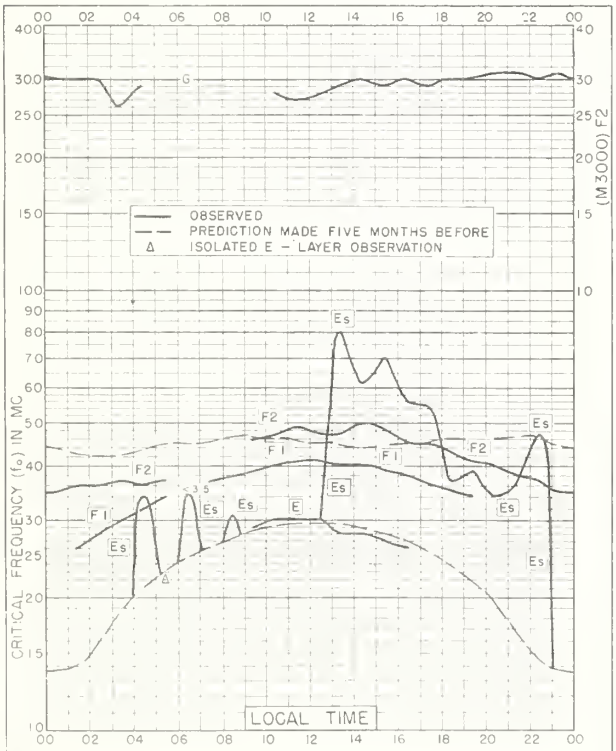


Fig. 95 GODHAVN, GREENLAND
69.2°N, 53.5°W JULY 1952

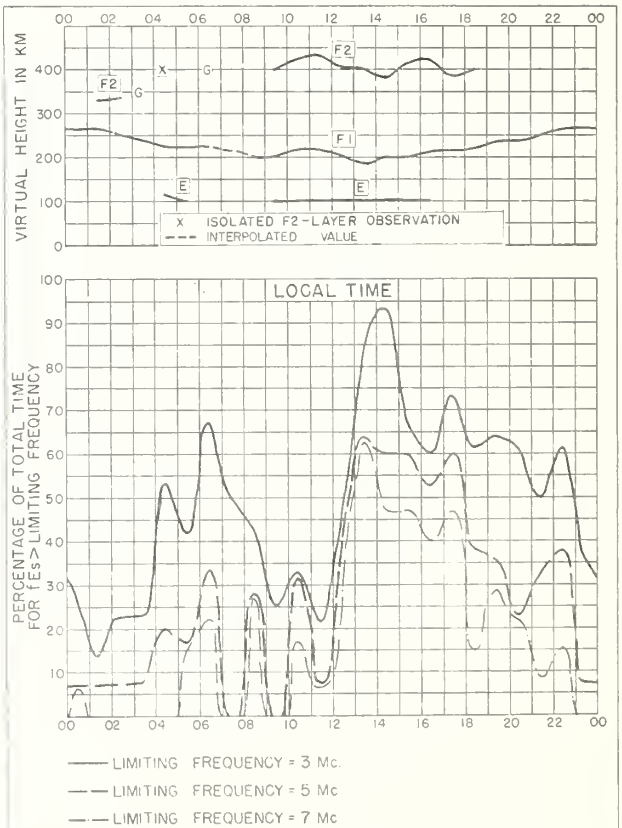


Fig. 96 GODHAVN, GREENLAND JULY 1952

Index of Tables and Graphs of Ionospheric Data

in CRPL-F112

Index (CRPL-F112, concluded)

CRPL and IRPL Reports

[A list of CRPL Section Reports is available from the Central Radio Propagation Laboratory upon request]

Daily:

Radio disturbance forecasts, every half hour from broadcast station WWV of the National Bureau of Standards.
Telephoned and telegraphed reports of ionospheric, solar, geomagnetic, and radio propagation data.

Semiweekly:

CRPL—J. North Atlantic Radio Propagation Forecast (of days most likely to be disturbed during following month).
CRPL—Jp. North Pacific Radio Propagation Forecast (of days most likely to be disturbed during following month).

Semimonthly:

CRPL—Ja. Semimonthly Frequency Revision Factors For CRPL Basic Radio Propagation Prediction Reports.

Monthly:

CRPL—D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11-499-, monthly supplements to TM 11-499; Dept. of the Navy, DNC 13 ( ) series; Dept. of the Air Force, TO 16-1B-2 series.)
CRPL—F. Ionospheric Data.
*IRPL—A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.
*IRPL—H. Frequency Guide for Operating Personnel.

Circulars of the National Bureau of Standards:

NBS Circular 462. Ionospheric Radio Propagation.
NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions.

Reports issued in past:

IRPL—C61. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.
IRPL—G1 through G12. Correlation of D. F. Errors With Ionospheric Conditions.
(G1, G3, available. Others out of print; see second footnote.)
IRPL—R. Nonscheduled reports:
R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Frequencies.
R5. Criteria for Ionospheric Storminess.
**R6. Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
R7. Second Report on Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
R9. An Automatic Instantaneous Indicator of Skip Distance and MUF.
R10. A Proposal for the Use of Rockets for the Study of the Ionosphere.
**R11. A Nomographic Method for both Prediction and Observation Correlation of Ionosphere Characteristics.
**R12. Short Time Variations in Ionosphere Characteristics.
R14. A Graphical Method for Calculating Ground Reflection Coefficients.
**R15. Predicted Limits for F2-Layer Radio Transmission Throughout the Solar Cycle.
**R17. Japanese Ionospheric Data—1943.
R18. Comparison of Geomagnetic Records and North Atlantic Radio Propagation Quality Figures—October 1943 Through May 1945.
**R21. Notes on the Preparation of Skip-Distance and MUF Charts for Use by Direction-Finder Stations. (For distances out to 4000 km.)
**R23. Solar-Cycle Data for Correlation with Radio Propagation Phenomena.
**R24. Relations Between Band Width, Pulse Shape and Usefulness of Pulses in the Loran System.
**R25. The Prediction of Solar Activity as a Basis for the Prediction of Radio Propagation Phenomena.
**R26. The Ionosphere as a Measure of Solar Activity.
R27. Relationships Between Radio Propagation Disturbance and Central Meridian Passage of Sunspots Grouped by Distance From Center of Disc.
**R30. Disturbance Rating in Values of IRPL Quality-Figure Scale from A. T. & T. Co. Transmission Disturbance Reports to Replace T. D. Figures as Reported.
**R31. North Atlantic Radio Propagation Disturbances, October 1943 Through October 1945.
**R33. Ionospheric Data on File at IRPL.
**R34. The Interpretation of Recorded Values of *fEs*.
**R35. Comparison of Percentage of Total Time of Second-Multiple *Es* Reflections and That of *fEs* in Excess of 3 Mc.
IRPL—T. Reports on tropospheric propagation:
T1. Radar operation and weather. (Superseded by JANP 101.)
T2. Radar coverage and weather. (Superseded by JANP 102.)
CRPL—T3. Tropospheric Propagation and Radio-Meteorology. (Reissue of Columbia Wave Propagation Group WPG—5.)

---

*Items bearing this symbol are distributed only by U. S. Navy. They are issued under one cover as the DNC 14 ( ) Series.
**Out of print; information concerning cost of photostat or microfilm copies is available from CRPL upon request.